PROJECT MANAGEMENT PLAN
for
AQUATIC ECOSYSTEM RESTORATION
for the
WALLA WALLA RIVER BASIN FEASIBILITY STUDY

SECTION 1.0 - INTRODUCTION

1.01 FEASIBILITY STUDY PURPOSE

This feasibility study will focus on the issues related to the restoration of ecological resources and ecosystem management within the Walla Walla River Basin (WWRB). The study will concentrate on the restoration of fish habitat quality as its main objective but will also evaluate all pertinent information and identify problems and opportunities that exist in the study area. The study will formulate the most effective and efficient actions for meeting the goals and objectives that will be developed for this feasibility study. The recommended plan must significantly contribute to established restoration objectives, benefiting biological resources and natural ecosystem functions and processes. It must also be technically feasible and economically cost effective (greatest Net Ecosystem Restoration Benefits, ER 1105-2-100, 22 Apr 2000). The primary product of the feasibility study will be conceptual plans for a preferred alternative/recommended plan for aquatic ecosystem restoration in the WWRB.

The feasibility study and feasibility report/Environmental Impact Statement (FR/EIS) will be a complete decision document in sufficient detail to form the basis for the Sponsor, the U.S. Army Corps of Engineers (Corps), and ultimately the U.S. Congress, to consider approving authorization and construction of the recommended plan. The feasibility study and FR/EIS will provide a complete presentation of the study analyses and results, including those developed in the reconnaissance report. The feasibility study and FR/EIS will also document compliance of the design with all applicable guidance, statutes, Executive Orders, and policies, and provide a sound basis for decision makers to judge the recommended plan.

1.02 PURPOSE OF THE PROJECT MANAGEMENT PLAN (PMP)

This PMP presents a plan of study to be used to define and manage the development and completion of a feasibility study for the WWRB. This PMP defines and documents the study assumptions, scope of work, tasks, products, and the level of detail required for the feasibility study. This PMP includes the baseline cost estimate, schedule, and the assignment of responsibilities. This PMP defines work tasks and products; provides the Corps' Walla Walla District management with a means for cost and schedule control; establishes the basis for changes; promotes both internal and external communications; and helps prevent review problems for the feasibility study. The PMP includes the following:

- Study tasks and responsibility for their accomplishment.

- The estimated cost of individual study tasks and total study cost, including the negotiated cost of work items to be accomplished by Sponsor as in-kind services.

- Corps of Engineers and other professional criteria to assess the adequacy of the completed work effort, including references to regulations and other guidance that will be followed in performing and evaluating tasks.

- The schedule of performance and milestones (i.e., key decision points, in-progress reviews, issue resolution conference, etc.).

- The specific coordination mechanism between parties to this agreement.

- Procedures for reviewing and accepting the work of the parties to this agreement.

The PMP is a working document and is expected to be revised/modified as needed throughout the study process. All changes in the PMP will be coordinated with the Project Delivery Team, the Sponsor, the Steering Committee, and the Executive Committee. Any schedule or cost changes require written agreement and approval from both the Sponsor and Northwestern Division (NWD).

The work shall generally be performed in accordance with established criteria and guidance including, but not limited to, the following:

a. Engineer Circular (EC) 1105-2-208, December 23, 1994, *Preparation and Use of Project Study Plans*, Department of the Army guidance for project study plans which guide the feasibility process.

b. EC 1105-2-210, June 1, 1995, *Ecosystem Restoration in the Civil Works Program*, Department of the Army guidance for ecosystem restoration activities.

c. Engineer Regulation (ER) 5-1-11, February 27, 1998, *Program and Project Management*, U.S. Army Corps of Engineers.

d. ER 200-2-2, March 4, 1988 [33 Code of Federal Regulation (CFR) 230], *Procedures for Implementing NEPA*, Department of the Army regulation on Environmental Quality.

e. ER 1105-2-100, April 2000, *Planning Guidance*, Department of the Army Regulation on Policy and Guidance for the conduct of civil works planning studies.

f. U.S. Water Resources Council Publication, March 10, 1983, *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies.*

g. ER 5-7-1 Federal Register (FR), March 1, 1991, *Project Management*, Department of the Army regulation for the overall management of civil works projects.

h. ER 1110-2-1150, March 31, 1994, *Engineering and Design for Civil Works Projects*, Department of the Army regulation for engineering level of detail in feasibility studies.

i. ER 405-1-12, *Real Estate Handbook*, U.S. Army Corps of Engineers.

j. ER 1165-2-501, *Civil Works Ecosystem Restoration Policy*, Corps of Engineers, 30 September 1999.

k. ER 1165-2-502, *Ecosystem Restoration-Supporting Policy Information*, Corps of Engineers, 30 September 1999.

1.03 STUDY SPONSOR

The cost-sharing responsibilities and the study obligations of the Corps and Confederated Tribes of Umatilla Indian Reservation (CTUIR) (referred to as the Sponsor throughout the remainder of this PMP) will be identified and clarified in this PMP. The PMP is the road map that will be used to guide this Feasibility Study.

1.04 STUDY AUTHORITY

The authority for this report is contained in the Resolution by the Committee on Public Works of the United States Senate adopted 27 July 1962. It reads as follows:

> "Resolved by the Committee of Public Works of the United States Senate, That the Board of Engineers for Rivers and Harbors, created under Section 3 of the Rivers and Harbors Act of 1902, be, and is hereby, requested to review the Reports on the Columbia River and Tributaries, published as House Document numbered 403, Eighty-Seventh Congress, and other pertinent reports, with a view to determining any modifications of the recommendations contained therein are advisable at this time, with particular reference to further development of land and water resources to meet anticipated regional requirements. The investigation will be coordinated with the Department of the Interior, Department of Health, Education and Welfare, the Department of Agriculture, and other interested Federal agencies and the States concerned."

1.05 STUDY AREA

The WWRB (figures 1-1 and 1-2) lies in Northeastern Oregon and Southeastern Washington. There are five counties within the WWRB, but it is primarily located within Umatilla County (Oregon) and Walla Walla and Columbia Counties (Washington). The WWRB is fan shaped, encompassing 1,758 square miles (sq mi)] [4,553 square kilometers (sq km)]. Of the total WWRB, 1,278 sq mi (3,309 sq km) or 73 percent is located in Washington; 480 sq mi (1,243 sq km) or 27 percent is located in Oregon. The eastern one-fifth of the WWRB lies in the steep, lightly timbered western slopes of the Blue Mountains within the Umatilla National Forest. The remainder of the WWRB consists of moderate slopes and level terrain.

The WWRB is part of the historical territory of the Walla Walla and Cayuse Tribes and the CTUIR. The land was ceded to the Federal Government under the Treaty of 1855. However, the Tribes still reserve rights for these lands that include the harvesting of salmon in the WWRB. The Walla Walla region was named from the Nez Perce word for the people that occupied "the valley of many waters," the historical territory of the Umatilla, Cayuse and Walla Walla Tribes, now known as the CTUIR. Mill Creek, located in the WWRB, is where the Tribes' Treaty of 1855 was signed, which ceded to the United States 6.4 million acres (2.6 million hectares) of the Tribes' lands, but also reserved (among others) the Tribes' right to fish at all usual and accustomed areas.

1.06 STUDY, REVIEW, AND AUTHORIZATION PROCESS

General Investigation (GI) studies are conducted in two phases in accordance with the Water Resources Development Act (WRDA) of 1986: the reconnaissance phase and the feasibility phase.

a. Reconnaissance Studies

A reconnaissance study, completed with full Federal funding, determines whether or not planning to develop a project should proceed to the more detailed feasibility study.

The Walla Walla River Watershed, General Investigation Reconnaissance Report, dated October 1997 (Reconnaissance Report), indicated that habitat for Endangered Species Act- (ESA-) listed salmonids as well as non-listed species/stocks could be restored by ecosystem restoration. While that report focused on restoration of flows to recover lost habitat quality, the current study will address that and a broader array of proven environmental restoration measures to restore fish habitat quality.

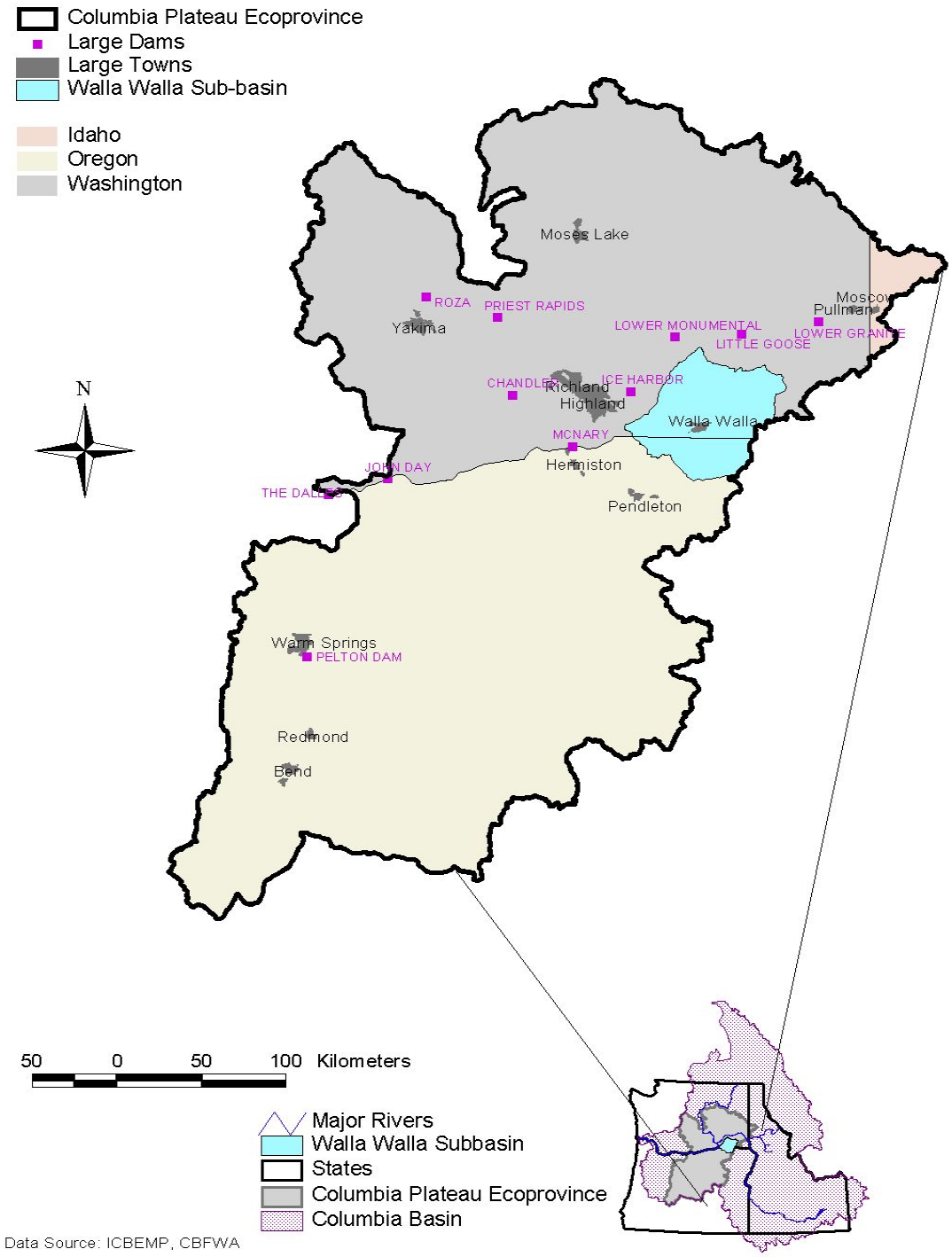


Figure 1-1. Location of the Walla Walla Subbasin Relative to the Three State Boundaries and Within the Columbia River Basin.

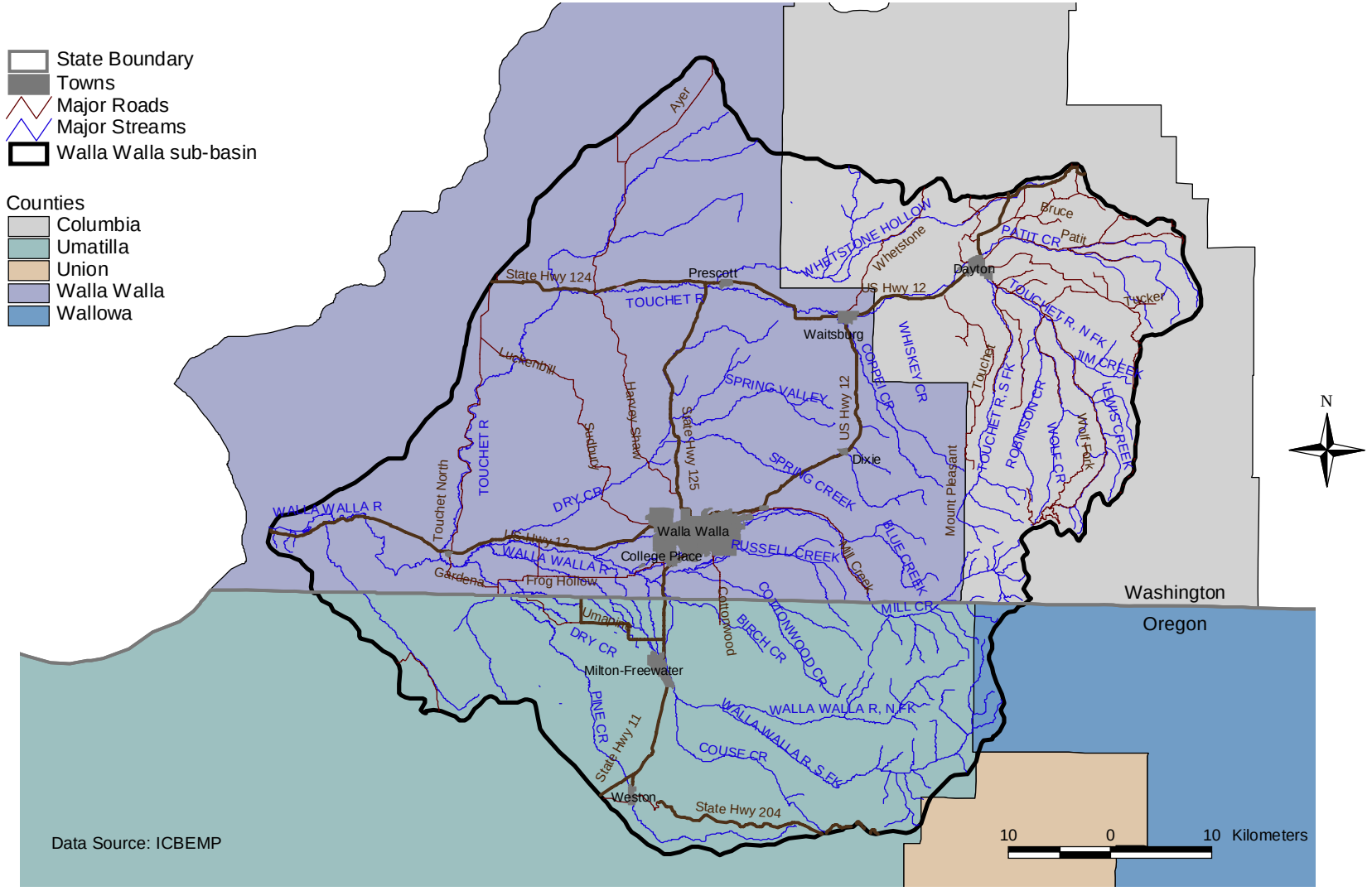


Figure 1-2. Location of Walla Walla River Tributaries Relative to State, County and City Boundaries and Major Roads.

b. Feasibility Studies

The Corps will develop the feasibility study in accordance with the schedules and narrative descriptions described in this PMP and other appropriate laws, regulations, and guidance governing the performance of feasibility studies including, but not limited to, 40 CFR Part 1500 and ER 1105-2-100. A feasibility study and FR/EIS will accomplish the following: develop conceptual plans for meeting study goals and objectives; provide a complete presentation of study results and findings, including a summary evaluation of alternatives; provide evaluations regarding compliance with applicable statutes, executive orders, and policies; provide sound and documented basis for both Federal and regional decision-makers to judge the recommended solution(s).

c. Feasibility Study and FR/EIS Review

The completed feasibility study and FR/EIS is forwarded to Corps Headquarters in Washington, D.C. for review. During this review, an issue resolution conference is conducted (if necessary) and all significant issues addressed and resolved. The Chief of Engineers' report, which includes recommendations, is prepared and forwarded along with the feasibility study and FR/EIS to the Assistant Secretary of the Army for Civil Works [ASA(CW)]. The feasibility study and FR/EIS, along with ASA(CW) recommendations, is then forwarded to the Office of Management and Budget (OMB) for review and comment.

d. Congressional Authorization and/or Appropriations

Once the recommendations and reports have been approved by OMB, the ASA(CW) forwards the report to Congress for authorization and then appropriations.

1.07 GENERAL FEASIBILITY STUDY REQUIREMENTS

The Corps planning process is grounded in economic and environmental Principles and Guidelines (P&G) that were promulgated in 1983. The P&G were set forth to provide for the formulation of reasonable plans responsive to national, state, and local concerns. The Corps planning process places specific emphasis on sound judgment and common sense in applying the planning P&G. The Federal objective of water and related land resources planning is to contribute to national economic development consistent with protecting the nation's environment in accordance with national environmental statutes, applicable executive orders, and other Federal planning requirements.

The Corps planning process follows a six-step process. The six steps are defined in the Corps P&G referenced above. The six steps are an iterative process. As more information is acquired and developed, it may be necessary to reiterate some of the previous steps. The six steps, though presented and discussed below in a sequential manner for ease of understanding, usually occur iteratively and sometimes

concurrently. Because of the iterative nature of this process, the EIS for the WWGI Study will be integrated with the feasibility study and FR/EIS, rather than be a separate stand-alone document. The integrated FR/EIS will satisfy the content and evaluation requirements of the Corps' six-step planning process and the procedural requirements of the National Environmental Policy Act (NEPA).

The six planning steps are:

Step 1 – Identifying problems and opportunities; objectives/constraints.
Step 2 – Inventorying and forecasting conditions.
Step 3 – Formulating alternative plans.
Step 4 – Evaluating alternative plans.
Step 5 – Comparing alternative plans.
Step 6 – Selecting a plan.

1.08 LOCAL SPONSORSHIP REQUIREMENTS AND COORDINATION

The Corps' Walla Walla District is responsible for the general management of this study. The CTUIR has agreed to become the Sponsor and cost share the feasibility study with the Corps' Walla Walla District. The cost of the feasibility phase will be shared equally (50/50) during the study between the Federal government and the non-Federal Sponsor. The CTUIR will provide in-kind services as described in this PMP, which may be up to their full 50 percent share of the feasibility study. The feasibility study in-kind service components have been negotiated and agreed upon between the Corps and the Sponsor as part of the development of this PMP, are documented in this PMP, and will be reflected in the Feasibility Study Cost Agreement between both parties.

The Sponsor will participate in the development of project objectives, formulation of conceptual plans for meeting study goals and objectives; provide a complete presentation of results and findings for components of the study as defined in the PMP; provide technical and policy expertise regarding the analysis and feasibility of alternatives; facilitate community input into the study process through Sponsor outreach projects, as well as through NEPA scoping efforts; and will assist in providing a sound and documented basis for both Federal and regional decision makers to judge the recommended course(s) of action.

1.09 REGIONAL CONSIDERATIONS

a. Walla Walla Subbasin Summary

The Columbia Basin Fish and Wildlife Authority (CBFWA) recently completed the *Draft Walla Walla River Subbasin Summary* (Draft WWSS), which is an extensive compilation of existing information that will be the basis for Bonneville Power Administration-funded ESA recovery efforts in the subbasin. This document has a detailed description of geology, hydrology, water quality, biota, and land use in the

subbasin, as well as a summary of historical and current fish and wildlife populations and habitat conditions and needs. This document is the result of a cooperative effort between the CTUIR, fish and wildlife agencies, and other natural resource agencies and organizations that work in the WWRB. Of particular importance to this feasibility study is the discussion of natural and human-induced limiting factors for production of salmonids and lamprey, which will be used as a general guide where appropriate for ecosystem restoration alternatives developed by this feasibility study.

As a part of the baseline studies in the project, a Walla Walla Watershed Assessment (see section 4.01), which provided the initial information for the Draft WWSS, will be completed to provide additional information to the process.

b. Oregon Total Maximum Daily Load (TMDL) for the WWRB

"*Reduce stream temperatures by restoring or enhancing riparian vegetation, floodplain function and increasing hyporheic and instream flows"* (Action 2.1 from Draft WWSS).
Note—Washington is just beginning their process for TMDLs for the northern portion of the basin. These efforts will be followed and used to the same degree that the Oregon TMDL process is.

c. National Marine Fisheries Service (NMFS), Confederated Tribes of the Umatilla Indian Reservation, Oregon Department of Fish and Wildlife (ODFW), and Washington Department of Fish and Wildlife (WDFW) Fish Passage Criteria/Proposed Actions Throughout the WWRB

"Continue to refine understanding of and/or determine location and timing of dewatered or flow limited stream reaches and prioritize them for instream flow restoration and enhancement activities" (Action 4.1 from Draft WWSS*).*

"Increase instream flows by lease and/or purchase of water rights" (Action 4.4 from Draft WWSS*).*

"Increase stream flows by improving the efficiency of irrigation systems and use of conserved water for instream use" (Action 4.5 from Draft WWSS*).*

"Implement screening of all diversions (pump and gravity) to meet State and NMFS criteria. Achieve compliance with state screening and passage laws" (Action 5.3 from Draft WWSS*).*

"Where feasible, consolidate diversions to reduce the number of artificial assage situations leading to fish mortality" (Action 5.6 from Draft WWSS*).*

SECTION 2.0 – AQUATIC ECOSYSTEM PROBLEMS

2.01 LIMITING FACTORS FOR AQUATIC HABITAT AND FISH

Seasonal flow limitations in the WWRB limit available salmonids habitat during certain times of the year. Impoundments, diversions, and flood control efforts have significantly modified channel depth and flow in the WWRB. Morphological and hydrological changes to the WWRB also occurred as a result of intensive agricultural practices. Irrigation withdrawals frequently result in dewatering of channels and/or reductions in depth, which is turn causes habitat loss.

Low stream flow conditions may limit fish use and movement at several key points in the WWRB. One of the most important of these sites is near the Oregon-Washington border downstream of the Nursery Street Bridge diversion dam near the city of Milton-Freewater, Oregon. A combination of factors leads to the seasonal dewatering of the Walla Walla River beginning between May and early July and lasting until the end of irrigation season in late September (Confederated Tribes of the Umatilla Indian Reservation, 1990; U.S. Bureau of Reclamation, 1999). This section of stream is naturally an alluvial fan--a large depositional area for flood gravel (Russell, 1897) and lacks heavy subsoil to slow hydrologic conductivity (Nielson, 1950). This combination was thought to create an area where the river naturally loses surface water to the gravel aquifer (Van Cleve and Ting, 1960). It should be noted, however, that other historical journals report year-round flows to Whitman Mission (Farnham, 1839). Prior to widespread irrigation, U.S. Geological Survey (USGS) flow records from 1903 to 1905 show minimum monthly flow averages at 97 cubic feet per second (cfs) [2.7 cubic meters per second (cms)] at Milton-Freewater. The current irrigation withdrawals aggravate the natural condition and ensure the channel goes dry downstream of the Nursery Street Bridge diversion dam. Currently, the dewatered section is between 3 and 6 miles [5 and 10 kilometers (km)] in length (U.S. Bureau of Reclamation, 1999). Channel condition in this area is associated with long-term channel disturbance, including gravel mining and channelization for flood control. Even as late as September 29 in 1998, a 0.5-mile (0.8-km) section was still dry (Mendel et al., 1999).

The seasonal flow reduction impacts the life cycle of identified key salmonid species upstream of Milton-Freewater. This flow reduction narrows the window of migration into the watershed by Chinook salmon and indigenous steelhead, routinely strands bull trout on their migration upstream from wintering areas in the lower watershed, and reduces or eliminates steelhead spawning and rearing areas. Personnel from the CTUIR and ODFW capture and relocate fish trapped in the plunge pool downstream of the dam and for a mile (1.6 km) or more downstream when flows subside. Results from the 1990 to 1995 period show that hundreds to thousands of redband trout/steelhead and 10 to 30 bull trout ranging between 3 and 17 inches (75 and 430 mm) in length were salvaged (Buchanan et al., 1997).

Above the Nursery Street Bridge diversion dam, about 60 diversions of various sizes remove water from the Walla Walla River and its forks throughout the year (T. Justus, OWRD, personal communication, February 2001). The most notable diversions are the Little Walla Walla Diversion and Milton Ditch. During the 1890s, the Walla Walla River was a braided system through the Milton-Freewater area. During the last decade of the 19th century and first decade of the 20th century, most of these braided channels were consolidated into the Little Walla Walla River, which essentially became an irrigation ditch at that time, although it is still classified as a natural river (U.S. Army Corps of Engineers, 1997).

Table 2-1 and figure 2-1 show limiting factors by reach and geographic management unit (GMU) identified by ODFW and CTUIR (with further review by WDFW anticipated). While lack of instream flow is the predominant factor, temperature, quality of habitat diversity, and riparian degradation are also limiting the viability of the aquatic ecosystem, and thus salmonids production. However, all of these issues are dependent (to some degree) on a minimum flow level to meet their requirements. Table 2-2 lists limiting factors by GMU and was compiled by the Bi-State Policy Group (Draft WWSS, Table 24 and Appendix J, respectively).

Table 2-1. Key Factors Limiting Salmonid Production in the Walla Walla Subbasin Listed by Geomorphic Management Unit and Stream Segments. Compiled by CTUIR and ODFW; WDFW to provide further review and input [from Draft WWSS].

Location	Key Limiting Factors[1/]	Steelhead Impacts			Sp. Chinook[2/] Impacts			Bull Trout Impacts		
		Migr	Spaw	Rear	Migr	Spaw	Rear	Migr	Spaw	Rear
Upper Walla Walla (UWW)										
S. Fk above Harris Park	None – Key stronghold area	All species and life histories benefited								
S. Fk below Harris Park	CH, IHD, RIP	--	X	X	--	X	X	--	X	X
N. Fk on USFS	None – Key stronghold area	All species and life histories benefited								
N. Fk below USFS	FL, TP, CH, IHD, RIP	--	X	X	--	X	X	X	X	X
Mill Creek (MC)										
Mill Cr. – Source to City Water Intake	None – Key stronghold area	All species and life histories benefited								
Mill Cr. – Water Intake to State Line	FL, PAS, CH, IHD	X	X	X	X	X	X	X	--	X
Mill Cr. – Stateline to Yellowhawk Div.	FL, TP, PAS, CH, IHD, RIP	X	--	X	X	--	--	X	--	--
Mill Cr. – Yellowhawk to Gose St.	FL, TP, WQ, PAS, CH, IHD, SED, RIP	X	--	X	X	--	--	X	--	--
Mill Cr. – Gose to mouth	FL, TP, WQ, PAS, CH, IHD, SED, RIP	X	--	--	X	--	--	X	--	--
Mid Walla Walla (MWW)										
Main stem WW – Forks to LWW Div.	PAS, CH, IHD, RIP	X	X	X	X	X	X	X	--	X
Main stem WW – LWW Div to Mill Cr.	FL, TP, PAS, CH, IHD, SED, RIP	X	X	X	X	--	--	X	--	--
Couse Creek	FL, TP, PAS, CH, IHD, RIP	X	X	X	--	--	--	--	--	--
Cottonwood, Russell and Reser Cr.	FL, TP, CH, IHD	X	X	X	--	--	--	--	--	--
Yellowhawk Creek	FL, TP, PAS, CH, IHD, SED, RIP	X	X	X	--	--	--	--	--	--
Garrison Creek	FL, TP, PAS, CH, IDH, SED, RIP	X	X	X	--	--	--	--	--	--
Pine Creek (PC)										
Pine Creek	FL, TP, PAS, CH, IHD, SED, RIP	X	X	X	--	--	--	--	--	--
Walla Walla (WW)										
Mill Cr. To McDonald Road	FL, TP, PAS, CH, IHD, RIP	X	--	--	X	--	--	X	--	--
McDonald Road to Touchet R	FL, TP, PAS, CH, IHD, SED, RIP	X	--	--	X	--	--	X	--	--
Lower Walla Walla (LWW)										
Touchet R. to mouth	FL, TP, PAS, CH, IHD, SED, RIP	X	--	--	X	--	--	X	--	--
Dry Creek (DC)										
Pine and Mud Creeks	FT, TP, SED, RIP	X	X	X	--	--	--	--	--	--
Dry Creek source to Hwy 12	FL, IHD, SED	X	X	X	--	--	--	--	--	--
Dry Hwy 12 to mouth	FL, TP, CH, IHD, SED, RIP	X	X	X	--	--	--	--	--	--
Lower Touchet (LT)										
Touchet R. Hwy 125 to mouth	FL, TP, CH, IHD, SED, RIP	X	--	--	X	--	--	X	--	--
Middle Touchet (MT)										
Touchet R. Dayton to St. Park	TP, PAS, CH, IHD	--	--	X	X	X	X	X	--	--
Touchet R. St. Park to Coppei Cr.	FL, TP, PAS, IHD	--	--	X	--	--	--	X	--	--
Touchet R. Coppei Cr. to Hwy 125	FL, TP, PAS, IHD, SED	X	--	--	X	--	--	X	--	--
Coppei Creek	FL, TP, IHD	X	X	X	--	--	--	--	--	--

Table 2-1 (continued). Key Factors Limiting Salmonid Production in the Walla Walla Subbasin Listed by Geomorphic Management Unit and Stream Segments. Compiled by CTUIR and ODFW; WDFW to provide further review and input (from Draft WWSS).

Location	Key Limiting Factors[1/]	Steelhead Impacts			Sp. Chinook[2/] Impacts			Bull Trout Impacts		
		Migr	Spaw	Rear	Migr	Spaw	Rear	Migr	Spaw	Rear
Upper Touchet (UT)										
N. Fk source to Wolf Fork	None – Key stronghold area	All species and life histories benefited								
N. Fk Wolf Fk to mouth	TP, IHD, PAS	--	--	X	--	X	X	X	X	X
Wolf Fork – source to Robinson Fork	None – Key stronghold area	All species and life histories benefited								
Wolf Fork – Robinson Fork to mouth	TP, IHD, SED, RIP	--	--	X	--	X	X	--	X	X
Robinson Fork	FL, TP, IDH, RIP	--	--	X	--	--	--	--	--	--
S. Fk Touchet: Griffin Fk to mouth	FL, TP, CH, IHD, SED, RIP	--	--	X	X	X	X	X	X	X
S. Fk Touchet: Griffin, Burnt and Green Fks	IHD, RIP	--	--	X	X	X	X	--	X	X

[1]Key Limiting Factors: FL = Flow; TP = Water temperature; WQ = Water quality (chemical); PAS = Passage; CH = Channel conditions; IHD = Instream habitat diversity; SED = Sedimentation; RIP = Riparian; X = Impact to specified life history state (Migr = Migration; Spaw = Spawning; Rear = Rearing)

[2]Spring Chinook are in initial stages of reintroduction, therefore impacts are presumptive based on habitat knowledge and anticipated areas of utilization.

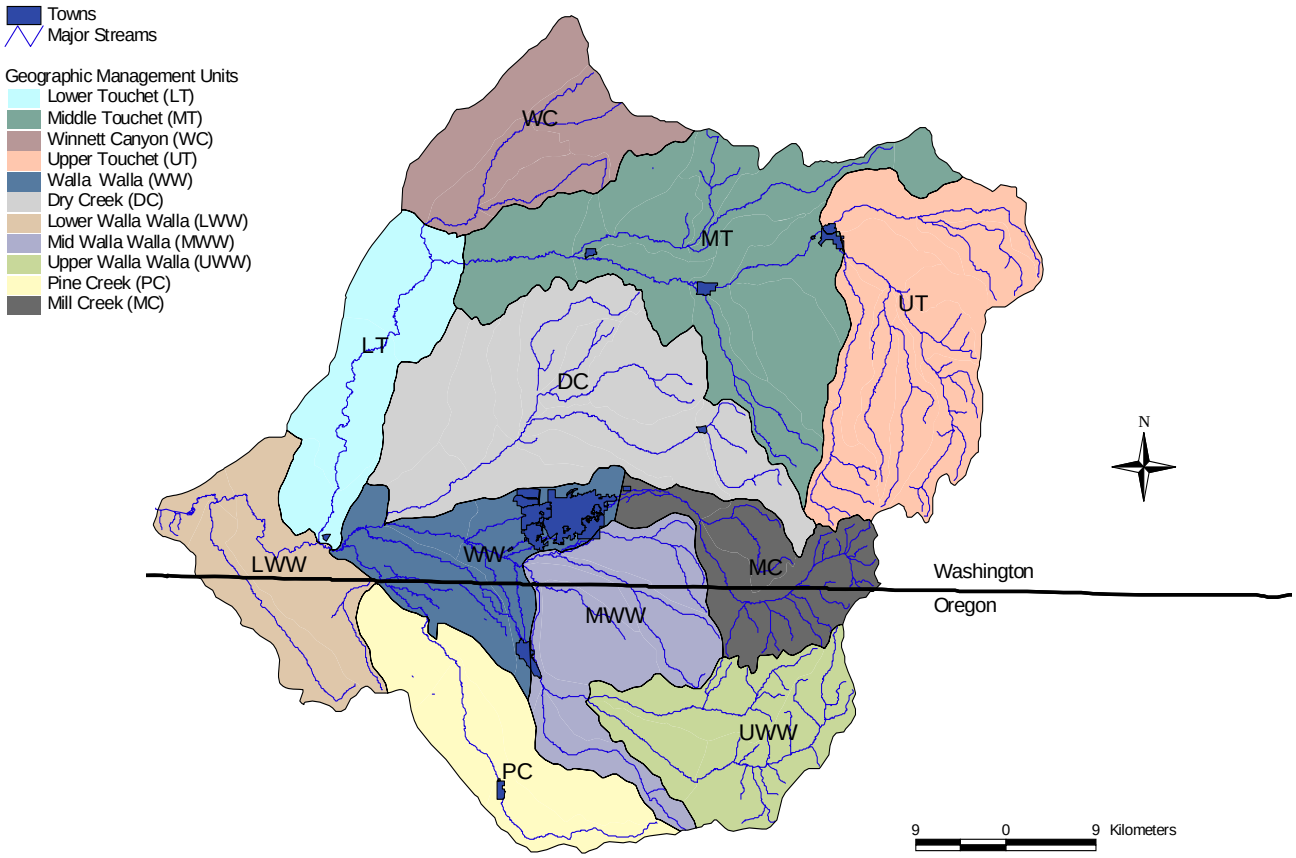


Figure 2-1. The Walla Walla Subbasin Stratified by Geographic Management Units (GMUs) [from Draft WWSS].

Table 2-2. Natural and Anthropogenic Factors that Limit the Production of Salmonids and Lamprey in the Walla Walla Subbasin. Compiled by Bi-State Policy Group (from Draft WWSS).

Limiting Factor	Geomorphic Management Unit (as defined in figure 2-1)
Unsuitable Flows (including low flow passage barriers)	Basin wide (general)
	Lower Touchet
	Middle Touchet
	Upper Touchet
	Walla Walla
	Dry Creek
	Lower Walla Walla
	Mid Walla Walla
	Upper Walla Walla
	Pine
	Mill
Unsuitable Stream Temperatures	Generic
	Lower Touchet
	Middle Touchet
	Upper Touchet
	Walla Walla
	Lower Walla Walla
	Middle Walla Walla
	Upper Walla Walla
	Pine Creek
	Mill Creek
Thermal Passage Barriers	Lower Touchet
	Middle Touchet
	Walla Walla
	Lower Walla Walla
	Middle Walla Walla
	Upper Walla Walla
	Pine
	Mill
Unsuitable Water Quality (Chemical)	Middle Touchet
	Walla Walla
	Lower Walla Walla
	Middle Walla Walla
	Mill Creek
Structural Passage Barriers (including entrainment and screening)	Oregon (general)
	Washington (general)
	Upper Touchet
	Lower Touchet
	Walla Walla
	Middle Walla Walla
	Mill Creek
Unsuitable Instream Habitat Quality and/or Diversity	Washington (general)
	Lower Touchet
	Middle Touchet
	Upper Touchet
	Walla Walla
	Dry Creek – Sed.
	Lower Walla Walla
	Middle Walla Walla
	Mill Creek

Table 2-2 (continued). Natural and Anthropogenic Factors that Limit the Production of Salmonids and Lamprey in the Walla Walla Subbasin. Compiled by Bi-State Policy Group (from Draft WWSS).

Limiting Factor	Geomorphic Management Unit (as defined in figure 2-1)
Unsuitable Riparian Condition	Walla Walla subbasin (general)
	Upper Touchet
	Middle Touchet
	Lower Touchet
	Walla Walla
	Middle Walla Walla
	Pine Creek
	Mill Creek
Exotic Species Competition	Touchet
Out of Basin Pressures Contributing to Poor Returns	OR
	WA
Data Gaps	Generic

Current main stem Walla Walla River flows at Milton-Freewater are depicted in figure 2-2. These are based on the average flows over the last decade. Life history timing for adult summer steelhead shows that migration generally ends prior to spring/summer flow drop-off. However, the period of adult spring Chinook return is cut off by diminishing flows that occur prior to completion of the run. Diminishing flows in early summer also eliminate rearing habitat for juvenile resident and anadromous fish. This occurs through the fall until natural flows increase and the irrigation season ends.

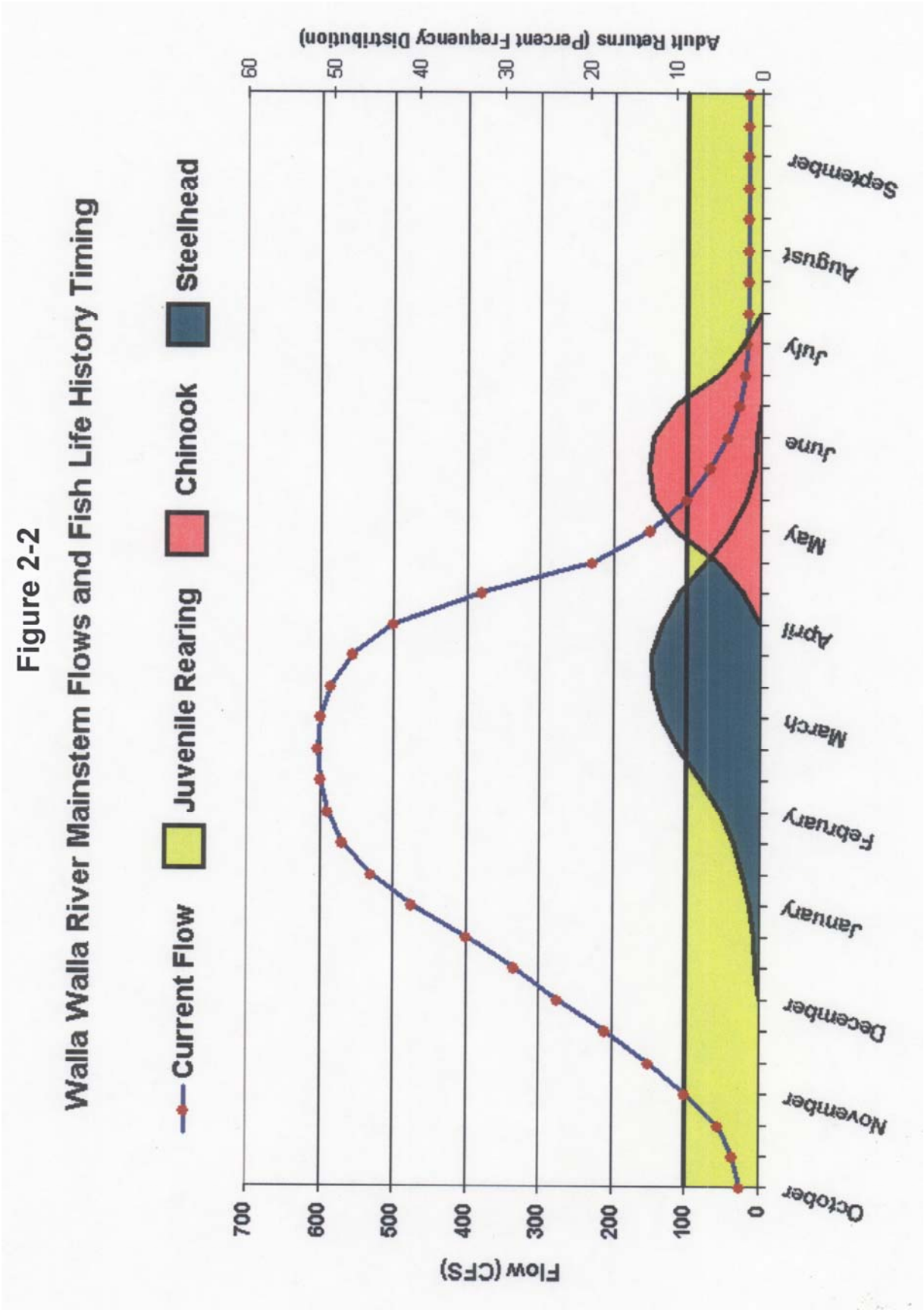
There are currently a number of proposed actions identified for the study objective. The proposed actions will be used to generate a reasonable range of action alternatives that will be evaluated through the NEPA process. The proposed actions are to move approximately to past historical flows as shown in figure 2-3.

For example, four proposed actions are currently under consideration for increasing flows (this may change once public scoping through the NEPA process has been conducted). As such, one alternative may include Columbia River exchange (a flow proposed action). Another example would be an alternative that may include irrigation efficiency and water rights purchase/lease (both flow alternatives). Refer to section 3.0 for a more complete discussion of alternatives development.

Implementation of the preferred alternative and achievement of increased instream flows in the Walla Walla River under this project is expected to be consistent with other ongoing flow enhancement efforts. All efforts should be viewed as complementary components with benefits to accrue cumulatively in a three-tiered basin-wide process, involving multiple players and including efforts that are not part of this project. At the first tier, significant instream flows were achieved in the main stem Walla Walla River beginning in 2000 and 2001 as part of a civil penalty settlement agreement between local irrigation districts and the U.S. Fish and Wildlife Service (USFWS). The objective of this initial effort was to avoid take of ESA-listed steelhead and bull trout.

Figure 2-2

Walla Walla River Mainstem Flows and Fish Life History Timing



A second tier to increase instream flows is the Habitat Conservation Plan (HCP, which is another process outside the scope of this feasibility study), also driven by the ESA listings. Increased flows through the HCP effort are to be sufficient enough so that Federal agencies administering the ESA will allow Irrigation Districts issuance of 50-year operational permits for incidental take. The anticipated gains in flow will complement the initial effort and will achieve more progress towards the target flows of the HCP process.

The purpose of the flow potential in the Corps/Sponsor project, the third tier of instream flow enhancement, is to help achieve the aquatic ecosystem goals as established by state and tribal fish managers in the Draft WWSS. These potential increase in flows, with their attendant benefits to fisheries, are in addition to other efforts made. The goal of the Corps/Sponsor project is to provide for abundant environmental benefits to the aquatic ecosystem (done in manner which supports the environment, economics, and social structure of the community).

Figure 2-3 shows Walla Walla River flows at Milton-Freewater that would provide the passage and rearing of steelhead and spring Chinook necessary to achieve CTUIR adult return goals in the Draft WWSS. These flow estimates are based on the best available flow data and professional judgment of CTUIR biologists. During the feasibility study, it will be determined if the Federal interest (as determined by the Corps of Engineers) will be the same amount, or a higher or lower figure.

The 100 cfs (2.8 cms) flow estimate derived by CTUIR biologists is consistent with a recent Instream Flow Incremental Methodology (IFIM) study report by Mendel (2001). Mendel's report (2001), Appendix G, lists preliminary results reported by Hal Beecher of an IFIM study of the Walla Walla River and Mill Creek conducted in June and July 1999. The IFIM study determined that the weighted-usable-area for juvenile steelhead "increases most rapidly up to 100 cfs (2.8 cms) in the Walla Walla River."

Don Butcher of the Oregon Department of Environmental Quality (ODEQ) and Bob Bower of the Walla Walla Basin Watershed Council (WWBWC) recently estimated "potential August mean discharge" that would occur without irrigation extractions. They used hydrologic models that utilize drainage area, precipitation for each watershed, and measured flow data. The estimates for each sub-watershed were added cumulatively downstream and calibrated with current and historical flow data where appropriate. They also accounted for the losing reach through Milton-Freewater. Their final estimate of potential August mean discharge ranged from 100 to 140 cfs (2.8 to 4.0 cms) for the main stem of the Walla Walla River from the confluence of the North and South Forks down to the mouth of Yellowhawk Creek. Butcher states, "[T]he proposed Corps-CTUIR feasibility study target of 100 cfs in August is within the estimated typical August flow regime, and well above the past depleted flow levels, and therefore we consider it a target of merit" (correspondence, ODEQ to Corps, February 4, 2002).

Each of the three methods used arrived at a similar flow target of around 100 cfs (2.8 cms). These targets are presented as a starting point, but they will be refined as necessary hydrology and geomorphic information is accumulated to accurately describe essential habitat attributes.

Fish passage criteria are not met when channels are completely dewatered or the flows are so low that adequate depth is not achieved with flows that are present. This can be the result of reduction of historic flows or degraded channel geometry where the channel is over widened.

Flows needed to restore juvenile salmonids to the Walla Walla River below Milton-Freewater are based on estimates of minimum flows from 1903-1905 when spring Chinook were known to be abundant (Walla Walla River Subbasin Production Plan, 1990). Below Milton-Freewater, the Walla Walla River becomes unsuitable for salmonids each summer when the river dewaters. Flow data from the USGS and the Oregon Water Resources Department (OWRD) were examined and summarized in table 2-2.

The instream flow needs of salmon and steelhead shown in figures 2-2, 2-3, and 2-4 mimic the natural spring and summer hydrograph in the WWRB. Figure 2-2 is an estimate of average natural hydrograph flows. This estimate is based on historical records for 1903-1905 (before major irrigation withdrawals) and the combination of North and South Fork discharges measured from 1931 to 1986. The study team recognizes the possibility of obtaining natural flows may not be feasible; therefore, an incremental benefit analysis will be done for all proposed actions to restore instream flow.

It is to be emphasized that instream flows in the WWRB will not be restored "just for the sake of having more water in the river." Flow levels will be tied to differing levels of biological outputs for each flow level. And a range of flows, say, from three to six different levels, could be examined for a given reach of river at different times of the year.

The proposed project flows for May through November fall between historic and current flows (figures 2-2 and 2-3). The historic flows are based on natural stream flows above Milton-Freewater and depict a "pre-development flow," which would have continued downstream in the absence of irrigation withdrawals. The proposed project flows are shown as a band that includes a range of flows believed to be necessary to address fish life history needs and, ultimately, help achieve the fishery manager's adult fish return goals. Actual project flows within the band are to be determined by opportunities, costs, water conditions (snow pack) in a given year, etc.

A goal of 100 cfs (2.8 cms) represents the minimum flow at Milton-Freewater before significant irrigation diversions. The average flows during the summer and late fall ranged from 120 to 140 cfs (3.4 to 4.0 cms). This range was developed from flow data collected at Milton-Freewater in 1903-1905 and the combination of available flow data from the North and South Forks of the Walla Walla River through 1991. Combining

flows from the North and South Forks indicate there is normally over 100 cfs (2.8 cms) in the main stem as does the records from 1903-1905 at Milton-Freewater (figure 2-3 and table 2-2).

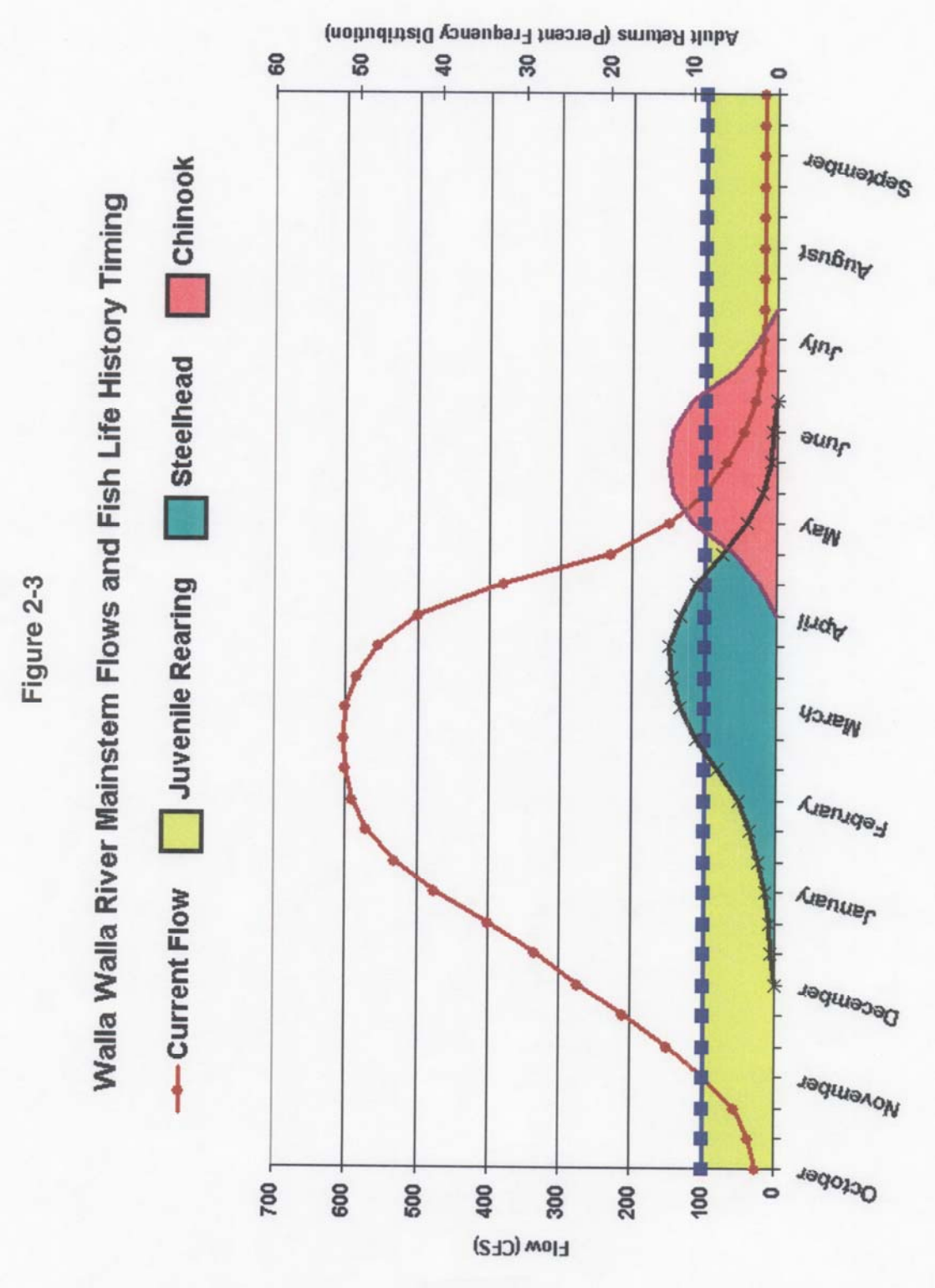


Table 2-2. Average Streamflows [cfs (cms)] in the Walla Walla River by Month (OWRD, 1988a; Walla Walla River Subbasin Production Plan, 1990).

USGS Gage Stations		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Ann
#1000	South Fork Walla Walla River	111 (3.1)	136 (3.9)	171 (4.8)	177 (5.0)	191 (5.4)	217 (6.1)	283 (8.0)	309 (8.7)	209 (5.9)	125 (3.5)	110 (3.1)	108 (3.1)	179 (5.1)
#10800	North Fork Walla Walla River (1970-1986)	10.3 (0.3)	26.9 (0.8)	56.6 (1.6)	90 (2.5)	84.3 (2.4)	100 (2.8)	118 (3.3)	101 (2.9)	46.3 (1.3)	13.2 (0.4)	8.89 (0.3)	8.26 (0.2)	54.5 (1.5)
#11000	North Fork Walla Walla River (1931-1970)	10.8 (0.3)	26.9 (0.8)	51.5 (1.5)	55.8 (1.6)	65.7 (1.9)	81.5 (2.3)	119 (3.4)	95.7 (2.7)	40.9 (2.7)	7.75 (0.2)	3.5 (0.1)	5.22 (0.1)	47.3 (1.3)

Water temperature is also an important factor in the development of target flows. One hundred (100) cfs (2.8 cms) of cold, high quality water in the main stem Walla Walla River will provide more miles of suitable habitat than 50 cfs (1.4 cms) of cold, high quality water. Water temperatures in the main stem increase as the water moves downstream. The incremental analysis will also include the effects of thermodynamics on the benefits the fish will realize from colder water; for example, justification for securing 100 cfs (2.8 cms) instead of securing 75 or 50 cfs (2.1 or 1.4 cms) is based on thermodynamics and the additional miles of habitat that will be gained.

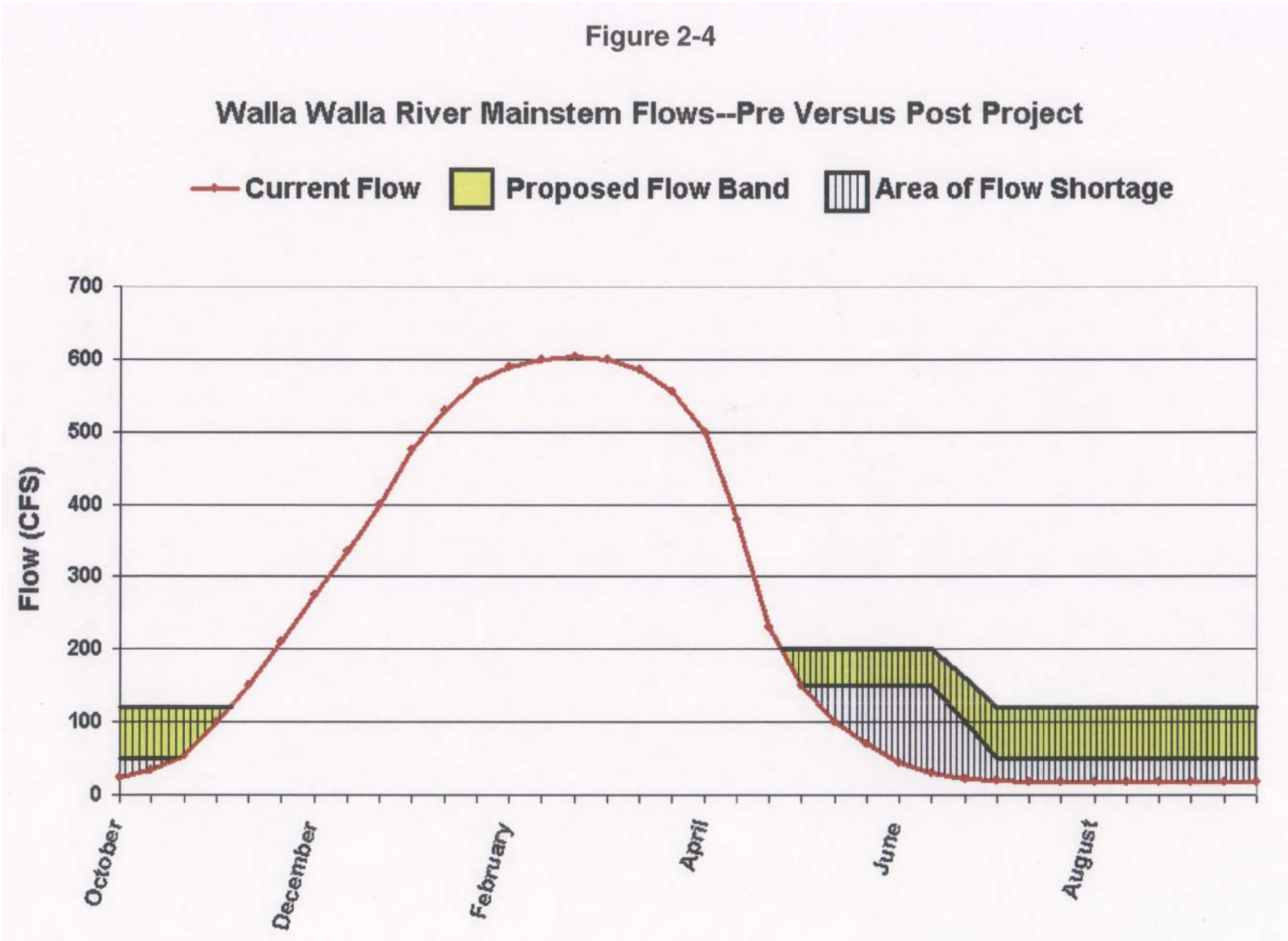
A possible increase in flows between current conditions and the band of proposed flows is shown in figure 2-4. The most deficient period is late spring/early summer, which impacts salmon migration and juvenile rearing. The remaining deficiency, which mainly impacts juvenile salmonid rearing, continues from early summer through fall.

Costs and benefits will be evaluated in this study. The first priority for securing instream flows sufficient to provide for adult and juvenile passage; the second priority is to secure flows for juvenile salmonid rearing and Pacific lamprey migration.

Costs/benefits will be evaluated to ascertain certain facts as to whether obtaining 80 cfs (2.3 cms) is more cost effective than 100 cfs (2.8 cms) because it may cost ten times more to restore 100 cfs (2.8 cms). In such a case, 80 cfs (2.3 cms) would likely be the preferred target. On the other hand, there may be an option that will provide 110 cfs (3.1 cms) for only a small increase of what it would cost to provide 100 cfs (2.8 cms). With the latter case, 110 cfs (3.1 cms) would likely become the preferred target since 110 cfs (3.1 cms) better reflects the mean discharge observed at Milton-Freewater during the summer (pre-development) and would expand salmonid habitat further downstream. The above figures are only used as an example.

The importance of water quality is paramount when developing options to restore flows to the lower Walla Walla River. Cold, clean water should remain in the channel. In other cases, the cold water from springs and tributaries needs to reach the main channel. Water sources with thermal and sedimentary pollutants could be routed into irrigation canals.

Figure 2-4


Walla Walla River Mainstem Flows--Pre Versus Post Project
Current Flow
Proposed Flow Band
Area of Flow Shortage
Flow (CFS)
700
600
500
400
300
200
100
0
October
December
February
April
June
August

The Draft WWSS stated that,

> "Depths of at least 9.5 inches for Chinook salmon and seven inches for steelhead at velocities less than 8 ft/s are necessary for upstream passage. Using linear regression of USGS gauge data and species requirements, Hunter and Cropp (1975) determined that a minimum flow of 80 cubic feet per second (cfs), as measured at Bolles, Washington, is necessary for anadromous fish passage in the Touchet River. Average stream flow in the Touchet River at Bolles was around 50 cfs from July through October from 1978-1989. Flows of 75 cfs are necessary for upstream migration on the main stem Walla Walla River independent of structures (U.S. Fish and Wildlife Service 1983, cited in Ebasco Services and S. P. Cramer and Associates 1992). Based on adult and juvenile passage observations of hatchery fish in the Umatilla River, it was estimated that spring Chinook need 14 days a minimum of 150 cfs to allow passage of adults from the mouth of the Walla Walla River to either Hofer Dam or Burlingame Dam; juvenile spring Chinook require five days (from time of release) at 150 cfs to allow for out migration (Zimmerman 1993)." [from Draft WWSS]

Low stream flows in the Walla Walla subbasin are usually attributable to diversions for irrigation. Low flows can be rectified by artificially increasing stream flow by adding flow to the stream and by reducing the quantity of water diverted for irrigation.

It should be noted that there will be concerns by many business and agricultural interests in the WWRB as to what the economic impact of salmon in the WWRB may mean. While it is impossible to state exactly what this cost or benefit would be today, it should be pointed out that this same question arose in the Umatilla River Basin when the CTUIR proposed to reintroduce salmon in that basin. The Corps and the Sponsor will seek to identify solutions that are beneficial to water right holders and provide sufficient instream flow for fish passage .

Since water rights exceed water available in the Walla Walla River subbasin, it will be necessary for the Sponsor to ensure that any gains in flow as part of an environmental restoration project remain in the channel as instream flow and are not available for diversion by downstream irrigators with water rights, whether within a given state or between states. Implementation of a flow enhancing alternative would only take place after this legal protection of instream flows was enacted.

2.02 CALCULATION OF BENEFITS

Benefits derived from the ecosystem restoration work coming out of this feasibility study will be derived at least in part from improvements to passage and rearing habitat in the WWRB. The unit of measure for quantifying biological benefits anticipated from these improvements will be the habitat unit (HU) that is the unit of measure to be used in the incremental cost/benefit analysis.

Benefits will initially be expressed in conventional units (i.e., rate of flow in cfs or area in square meters) and then converted to HUs. The formulas for converting between conventional units and HUs will be developed in the feasibility study. Formulas for this conversion will be based on the relative biological value of a particular habitat attribute according to the best judgment of Corps and Sponsor fisheries professionals. Conversion to HUs requires that consideration be given to the relative effect that temperature, depth, and velocity under different flow regimes have on passage (adult and juvenile) and rearing habitat. It is important to note that formulas for this conversion will also take into account the unique capability of this study to increase flows significantly without any negative effect on other water users. For instance, other WWRB forums could possibly increase flows to meet the depth and velocity requirements for adult passage or to meet the state TMDLs for temperature. However, this study is the only initiative to increase flows enough to restore the ecosystem processes necessary for the significant increase in fish production. This desired state of restoration, while being a significant benefit, would be far from a complete restoration effort to pre-Columbian conditions.

SECTION 3.0 – PROPOSED STUDIES AND ACTIONS

3.01 INTRODUCTION

Initially, the feasibility study will focus on two issues that are fundamental components of the restoration of ecological resources and more specifically the main study objective defined in section 1.01 as "restoration of fish habitat quality." Those issues are:

- Meeting NMFS, ODFW, and WDFW fish passage criteria throughout the WWRB.

- Meeting Oregon and Washington TMDLs throughout the WWRB.

The feasibility study will formulate and evaluate a full array of possible actions and alternatives for meeting the study objective (Aquatic Ecosystem Restoration). The type and number of alternatives is expected to change over the life of the feasibility study (i.e. new alternatives may be formulated and other eliminated based upon preliminary screening). Initially, the feasibility study will focus on the specific options listed below, or combination thereof.

3.02 MEETING NMFS, USFWS, ODFW, AND WDFW FISH PASSAGE CRITERIA THROUGHOUT THE WWRB

Fish passage for native salmonids is not possible when depth and velocity are not within the swimming ability range of target species. Fish passage criteria that will be used in this feasibility study are described in section 2.01.

Problems with fish passage in the WWRB have resulted from:

- Reductions in flow.

- Degraded channel geometry.

a. Reductions in Flow

Reductions in flow in the WWRB are usually attributable to diversions for irrigation. Low flows can be rectified by artificially adding flow to the stream and/or by reducing the quantity of water diverted for irrigation.

Options for adding flow include:

(1) Storing water in off-channel reservoirs when it is available and releasing it when it is needed.

(2) Piping water in from another drainage to augment irrigation flow in the subbasin needed (water from this method would be used for consumptive purposes, allowing flow in the river to be left as instream flow).

Options for reducing irrigation withdrawals include:

(3) Reducing the amount of water wasted or lost in the off-channel irrigation system and maintaining water saved as instream flow.

(4) Reducing the amount of water used for irrigation by purchasing water rights from willing sellers and leaving water in the stream.

NOTE: Since existing, valid water rights exceed water available in the WWRB, it will be necessary for the Sponsor to acquire the appropriate water rights or otherwise ensure that any gains in flow remain in the channel and are not available for diversion by other irrigators with deeded water rights. This would also include instream water being protected across state boundary lines. This issue will have to be resolved before any implementation of preferred alternative(s) could take place.

Option 1: Water Exchange: Piping Water from Another Drainage to Augment Irrigation Flows

The model for this concept is the Umatilla River where a pipeline was constructed to pump water from the Columbia River to provide irrigator needs and reduce diversions from the Umatilla River. This concept was initially evaluated in the Reconnaissance Report and will be considered as an option in this feasibility study.

The water exchange alternative takes water from the Columbia River and pumps it to the existing irrigation delivery systems that currently divert water from the Walla Walla River at or below the Milton-Freewater area. A water intake, main pumping plant, booster pumping stations, and piping systems are included in the system. The location of the water intake will be near the confluence of the Walla Walla and Columbia Rivers. The location of the water outtakes should include adequate access to all cooperating irrigation district distribution infrastructure.

Water from the Columbia River will be used by the irrigation districts. They in turn will not divert that same quantity of water from live flow in the river. Thus more flow will be left in the river for environmental purposes.

The initial process is to secure the required aerial mapping of the proposed routing of a water delivery system (This was already done in 2002). Once a tentative route is determined, supplemental aerial or land-based surveys and the subsequent

mapping will be done to provide information to design and quantify the delivery system. Need similar level of design work as that done for irrigation efficiency and storage.

Only one conveyance alignment will be examined to convey water from the Columbia River to the irrigation systems in and around Milton-Freewater, Oregon and downstream irrigation systems to include at least Gardena Farms, and possibly the Lower Touchet Eastside/Westside district as well. The water in the Milton-Freewater area is to be supplied to "The Frog". Water provided for Gardena Farms will be determined after discussions with members of that district. The route will follow that which is the most topographically suitable for the pipeline in the valley. It is recognized that eminent domain may have to be used in order to make this a viable possibility.

Archeologists, aquatic and wildlife biologists will be involved in all phases of determining project location and design to ensure appropriate consideration of fish and wildlife resources and to evaluate mitigation requirements as appropriate. Cultural resources will need to be consulted as well, especially CTUIR Cultural Resources Protection Program. Irrigation District managers will be involved in determining the most effective alignments of the delivery system. Washington Department of Transportation will be consulted in determining the compatibility of the pipeline with the new alignment of Highway 12.

The alignment will have two options (quantity sizes):

1) Supply water only to the Milton-Freewater area. This would be to supply a maximum quantity of 150 cfs
2) Supply water to the Milton-Freewater area and also to Gardena Farms. This would be to supply a maximum quantity of 225 cfs to the point of the diversion for Gardena Farms, then 150 cfs for the remainder of the distance to Milton-Freewater (the first figure will be higher if the Lower Touchet irrigation district is included in the delivery system as well).

Option 2: Off-Channel Storage Reservoirs

Four sites were listed in the Reconnaissance Report as having potential for storage dams, and two more sites were requested by the Sponsor. For the feasibility study, it will be assumed that seven sites will be explored. One of these seven sites will examine the possibility of expanding the capacity of Bennington Lake, just outside the city of Walla Walla, Washington.

An initial screening of identified sites will be done. While no on-site investigations will be done other than a visual reconnaissance of each site, the sites will be evaluated based on potential foundation quality, structural configuration, local impacts, and other relevant factors. This initial screening will reduce the number of sites to be studied in detail to two sites.

Hydrology Section will develop all information necessary to configure the dams properly. The hydrologic products necessary to select storage sites are elevation-storage curves, estimated annual runoff, probable maximum precipitation, volume frequency curves, and dam failure analysis. It is not presently known what information may currently exist for all the sites to be evaluated.

The next phase of the project is to collect site information from both of the sites. Each site will be surveyed and mapped to provide adequate ground contours from which to locate the best dam alignment and to determine construction quantities. A minimum level of foundation explorations will be staged to provide information on the quality of the foundation and the extent of foundation treatment required for the selected structures. Two to four drill holes are anticipated at or near the proposed dam axis at each site. Two to four test pits per site (eight total) are planned to determine foundation conditions at other locations at four sites. Additional exploration data is required from locations where potential construction materials will be borrowed.

An appropriate structure and appurtenant structures will be determined for each site and a feasibility level design developed. The design will provide sufficient detail for all the identified structures in order to determine construction quantities and construction schedule. Facilities to convey water to the proper locations for irrigation or fishery use will be included in the design.

Fishery and wildlife biologists will be involved in all phases of determining project location and design to ensure appropriate consideration of fish and wildlife resources and to evaluate mitigation requirements for Option 1 as appropriate.

Option 3: Irrigation Efficiency

The existing irrigation systems use unlined canals that have high seepage losses and sometimes inefficient application techniques. The idea with water efficiency is to prevent seepage losses and improve the application methods, with the saved water being available to enhance instream flows. Three areas will be considered:

- Evaluation of several canal lining systems to reduce seepage.
- Consolidation of the existing irrigation delivery system to reduce the opportunity for seepage losses.
- Improvements to irrigation application methods.

The consolidation could vary from minor adjustments to a more complex design. If this option proceeds to the plans and specifications phase, detailed mapping will be required.

The initial required action is to perform a comprehensive evaluation of the condition of the irrigation system. A condition survey of the irrigation ditches, distribution boxes, and related features will be done. In addition to data collection of existing information and literature searches, seepage testing of segments of the system may be required. The survey will identify where improvements or changes could be made that would increase the efficiency of the system and, consequently, reduce the volume of water removed from the river. This work will be managed by, and in part performed by, Hydrology Section.

(a) Irrigation Ditch Efficiency

Following the comprehensive evaluation by Hydrology Section that will evaluate seepage losses within the irrigation ditch system and the Walla Walla River channel, a series of modifications will be developed to reduce the seepage losses. Soils/Civil Design Section will conceptualize and detail system modifications with assistance from hydraulic engineers. The final product will include a cost estimate for performing the recommended modifications.

(b) Consolidation of Irrigation Facilities

As a result of the comprehensive evaluation, consolidation of the existing irrigation ditches into a more efficient delivery system will be considered. This measure is a water conservation measure intended to leave more water in the Walla Walla River for use by fish. Soils/Civil Design Section will conceptualize and detail system modifications with assistance from hydraulic engineers. The final product will include a cost estimate for performing the recommended modifications.

(c) Irrigation Application Efficiency

Three of the most common types of irrigation application are flood, sprinkler, and drip. Hydrology Section will evaluate the current irrigation application methods to determine if water can be saved by using other irrigation techniques. These methods of applying irrigation water to crops have widely differing rates of efficiency. Current application methods will be evaluated for the potential to conserve more water for instream flow by converting to a more efficient method. This study will be a Geographic Information System (GIS) level evaluation where consideration is limited to land use, soil type, environmental factors, and other broad factors.

Wildlife biologists will be involved in planning Option 3 to ensure appropriate consideration of fish, wildlife, and wetland resources and to evaluate mitigation requirements as appropriate. The need for input on fishery resources in the planning phase of Option 3 is not anticipated at this time.

As a possible mitigative measure for the irrigation efficiency measure, Shallow Aquifer Recharge (SAR) will also be examined as part of this study. This will encompass talking

2-5 test areas in the Walla Walla valley. Each test area will have water spread on it and allowed to seep into the shallow aquifer of the basin. Then monitoring will be done to determine where and when this water is returned to the system.

A fully developed scope of work for this effort is attached to this PMP as Appendix #1.

Option 4: Water Right Acquisition

This option includes the Sponsor's efforts to undertake the possibility of securing existing water rights through purchase on a willing seller basis. This will include costs to buy legal options to buy water rights in the future (both the negotiations and actual cost of the option itself). The following locations will be explored.

- Oregon: Water within main stem Walla Walla River and Mill Creek subbasin.

- Washington: Water in main stem Walla Walla River, Mill Creek subbasin and Touchet subbasin.

The following list describes some of the components for the development of an acquisition strategy.

(a) The WWRB has been identified as a high priority geographical area for acquisition. The selection was based on river basins in which aquatic and related ecosystems are still in relatively good health, but where there are significant flow problems exacerbated by water withdrawals.

(b) The focus on the WWRB is also due to the political, social, and economic climate being one that is likely to support a market-based approach to recovering stream flows.

(c) Developing an acquisition strategy involves selecting priority streams within a river basin by delineating the resource values that are to be protected and restored, and evaluating the conditions of the system that would affect recovery. An initial selection has been identified; however, those priorities could change as the strategy is being developed and as other components of the project necessitate changes in scope or interest. The initial priority areas include the main stem WWRB and Mill Creek subbasin in Oregon and the Mill Creek subbasin and Touchet subbasin.

(d) Once priority streams and reaches are evaluated based on ecological criteria, stream conditions, and social and economic factors, it will likely be necessary to delineate a range of priority water rights that will provide the most flexibility and enhance success of a water right acquisition program.

3.03 MEETING OREGON AND WASHINGTON TMDLs THROUGHOUT THE WWRB

The importance of water quality is paramount when developing options that restore flows to the lower Walla Walla River. Cold, clean water should remain in the channel. In other cases, the cold water from springs and tributaries needs to reach the main channel. Water sources with thermal and sedimentary pollutants could be routed into irrigation canals.

According to the Draft WWSS, "Temperature is the parameter of primary concern in the Walla Walla drainage, with much of the lower Walla Walla remaining above 68 °F (20 °C) for most of the summer. Other §303(d) listings include flow, pesticides, pH, nitrates, and fecal coliform bacteria."

SECTION 4.0 - REQUIRED BASELINE STUDIES

The feasibility study will present the potential alternatives in a comparative form, defining the issues and providing a clear basis for the choice among options. In order to compare potential alternatives effectively, a common point of comparison must be established upon which to judge the alternatives or in other words a baseline. The baseline studies will establish the current existing conditions in the WWRB with respect to surface water, groundwater, and biological communities. This information will be a basis for comparison of alternatives.

4.01 WALLA WALLA SUBBASIN ASSESSMENT

In 1999, the Sponsor contracted with Washington State University (WSU) to conduct an assessment of the Walla Walla Subbasin. The ongoing efforts of this assessment have been used to develop the Draft WWSS referenced in section 1.09 of this PMP. The Sponsor will finance Ecopacific dba Ecovista to complete this assessment in 2002 for use in providing this study with updated data to be used in the subbasin planning process as a baseline analysis of limiting factors for aquatic systems in the subbasin.

The assessment will integrate relevant new data and information that has been developed over the last year or that has been left out of previous efforts. The assessment will focus on aquatic systems, but will include information about terrestrial systems pertinent to understanding aquatic conditions.

The assessment will involve review by a group of scientists from agencies involved in the Walla Walla subbasin.

The assessment will contain:

- An introduction that gives an overview of the history and goals of the project.
- Historical and scientific context for issues in the subbasin.
- A detailed summary of aquatic habitat conditions in the subbasin.
- Detailed information on key aquatic populations in the subbasin.
- An analysis of ecological function and changes in those functions relevant to aquatic ecosystems in the subbasin.
- Information on limiting factors, including a matrix of conditions, and limiting factors by sixth field HUC and management, and supporting analysis.

- Recommendations including identification of data gaps, general lessons learned during the assessment process, and other recommendations not specific to earlier discussions.

4.02 HYDRAULIC AND HYDROLOGICAL STUDIES

The hydraulic and hydrological baseline studies have two components. The first is a surface water study or water budget; the second is a groundwater study. These studies are very closely related and will be conducted simultaneously. The water budget will incorporate the results of the groundwater study.

a. Water Budget

The compilation of baseline information regarding the existing hydrology of the river, canal system, and groundwater involves the development of a water budget, defining how much and where stream flows are being used, diverted, lost, and conserved. This information can then be used in conjunction with the alternatives to develop the best, most efficient, most cost effective alternative or combination of alternatives to meet the study purpose/goal and objectives.

The water budget will be developed in the following manner by the Corps of Engineers . First, a comprehensive analysis will be done on all existing surface water data and historical reports for the river and canal system. Second, if needed, additional flow measurements will be taken. The area of study will be limited to the main stem of the Walla Walla River from the city of Milton-Freewater downstream to the confluence with the Touchet River. The number of additional flow measurements will be limited to 25 measurements. Each measurement will consist of no more than three consecutive sets of velocity measurements across the width of the channel from which an average flow will be computed. Once a complete set of data is obtained, the third step will be to develop a generalized hydrologic model of the river, major diversions, channel bed, evaporative losses, and major canal network. The most appropriate hydrologic model will be selected once the data is collected.

For the purpose of the surface water budget, a major diversion and major canal will be defined as having a flow of at least 1 cfs (0.03 cms). Smaller diversions and canals will be lumped together in appropriate locations. The fourth step will be to add the results of the groundwater study to the hydrologic model. Fifth, the model will be calibrated to historical flows at specific points and to current conditions. The final analysis will be done by the Corps. Each alternative will be modeled in the hydrologic model (a separate model run for each alternative) to determine the effects of the alternative on the river. This analysis will be limited to a total of 16 hydrologic model runs with different alternatives or combinations of alternatives. Additional model runs will be additional work if needed. (Note the term model run is used to describe a complete analysis of an alternative using the hydrologic model.) The final step will be to present the five best alternatives or combinations in GIS format.

b. Groundwater Study

The baseline analysis includes a groundwater study and a water budget. The purpose of the groundwater study is to answer four important questions and support the water budget. The four questions are:

- What is the current seepage in the river channel?
- How is the rate of seepage changing over time?
- What is the maximum possible rate of seepage from the channel?
- What is extent of interaction with nearby wells?

The groundwater study for the baseline analysis applies only to the main stem of the Walla Walla River from the Nursery Bridge in Milton-Freewater downstream to the Touchet River. The sponsor's study only covers Oregon, so the Corps will do this work from Stateline to the Touchet River.

The current seepage from the river channel must be determined to assess the total flow needed to meet the target surface-water flows. The seepage rate will be determined by dividing the Walla Walla River from Milton-Freewater to the Touchet River into three reaches. The extent of these reaches will be determined as part of the study. Generally, there are three different types of channel bed material in the Walla Walla River resulting in different seepage rates. In the vicinity of Milton-Freewater, the river is on an alluvial fan with a large amount of gravels and cobbles, producing larger seepage rates. Down near the mouth, the channel is flat with much more silt, resulting in much lower seepage rates. Between Tum-A-Lum Bridge and the Touchet River, there is a transition area with more "average" seepage rates. Once these reaches are identified, a 4-mile representative section for each reach will be selected and analyzed. Careful flow measurements will be taken within these sections, including any withdrawals, to determine total flow loss for the section. No more than 14 flow measurements per section will be taken. Each measurement will consist of at least three consecutive sets of velocity measurements across the width of the channel from which an average flow will be computed. Then, the seepage rate for the section will be calculated, accounting for evaporation and other losses. The seepage rate for each section will be applied to the respective reach to determine the current seepage for the river.

The rate of change in the seepage is more difficult to determine. All available historical studies and reports and well logs will be examined to determine as best as possible the rate of change in the seepage. If needed, additional flow seepage measurements, as described above, will be taken over a period of time to determine the rate of change in seepage. No more than three additional sets of seepage measurements will be taken.

The maximum possible seepage rate (or porosity) for the existing channel will be calculated using standard methods. Channel bed material will be collected and analyzed through pebble counts. One sample from each reach will be collected and analyzed. The results of the data analysis will be used to calculate the maximum seepage rate for the channel. Piezometers will be used to determine vertical hydraulic conductivity. This information will be critical if there is difficulty in calculating the rate of change in seepage over time. The seepage rate of change and the maximum seepage rate will be used to predict the future seepage in the channel so that the long-term likelihood of the success can be assessed.

The final question regarding nearby well interaction will be answered by determining the drawdown curves for wells in the three reaches mentioned above. The drawdown curve will be measured for 21 representative wells in each reach. The drawdown curves and water elevations in the channel should give an indication of the interaction zone between the river and wells. The location of all wells near the river will be plotted and the amount of interaction predicted. If there are any large wells in the interaction zone, additional measures may need to be examined to ensure that water (including groundwater) provided to meet instream flow targets will not be pumped by the well for other uses.

c. Hydraulic Study

A surface water hydraulics model of the Walla Walla River will be compiled by the Corps. The model will be used to determine the river depths, velocities, etc. that will be used by the team to determine the environmental and aquatic benefits resulting from each alternative. This information will be used in the incremental benefits analysis to determine the best alternative. It should be noted that a significant portion of the hydraulic model exists and will be updated, linked, and calibrated for this study. The hydraulic model will extend from just upstream of the Cemetery Bridge in Milton-Freewater to the Touchet River. It will be divided into three different reaches with a different level of detail for each reach. The first reach will extend from approximately Cemetery Bridge to Nursery Bridge. The second reach will extend from Nursery Bridge to the Birch Creek Road Bridge. The third reach will extend from the Birch Creek Road Bridge to the mouth of the Touchet River.

Survey information will be needed for the channel between Cemetery Bridge and the state line. Within the first reach, channel sections will be taken at a rate of 5 cross sections per mile, totaling about 8 cross sections (3 to 4 cross sections per km, totaling 6 to 8 cross sections). The second reach will need 10 cross sections per mile for a total of about 30 cross sections (6 cross sections per km for a total of 9 to 12 cross sections). The third reach will need cross sections at a rate of 5 cross sections per mile for a total of 10 cross sections (3 to 4 cross sections per km for a total of 6 to 8 cross sections. Hydraulic models already exist from the state line to the Touchet River, so survey data will not be needed in this section of the river. These models will be combined into one model including the surveyed reaches. As directed by the project manager, the costs for surveying and model generation for the second reach have been

removed from this project. This assumes the required information described above will be generated by an Corps of Engineers 1135 project on this reach (between Nursery Street Bridge and Tum-A-Lum Bridge on the Walla Walla River; Oregon). It is assumed that the 1135 project will be completed before the baseline surface water model is developed as part of this study. If this information is not available or the 1135 project is canceled, the scope and budget for this study will have to be changed to obtain the required survey data and generate the hydraulic model. The cost to obtain the required information for the second reach is approximately $40,000. The entire model will be calibrated to low flows and used to analyze each of the alternatives. The hydraulic analysis of alternatives will be limited to 16 alternatives. The analysis of any additional alternatives will be considered extra work. The results of the analysis will be presented graphically and numerically using GIS maps, charts, and tables.

4.04 WALLA WALLA SUBBASIN BIOLOGICAL BASELINE STUDIES

The general scope of this activity includes compilation of existing information with additional monitoring and evaluation as required to adequately complement the dataset on natural spawning, rearing, migration, survival, age and growth characteristics, and life histories of adult steelhead and their natural progeny in the Walla Walla and Touchet Rivers and Mill Creek.

Specific objectives of this study would apply to the primary salmonid species of concern, Middle Columbia River steelhead, Columbia River Basin bull trout, and reintroduced spring Chinook salmon, and would include the following:

- Evaluate passage and potential delay of adult steelhead and bull trout associated with instream flow levels and irrigation diversion and flood control structures in the WWRB utilizing radio telemetry and physical inspections.

- Monitor salmonid spawning distribution with redd counts and carcass surveys in the WWRB.

- Estimate juvenile salmonid abundance and rearing densities at index sites using electrofishing and snorkel techniques.

- Determine age, growth, and life history characteristics of salmonids in the WWRB.

- Utilize passive integrated transponder (PIT) -tag technology to evaluate the timing and relative survival of juvenile steelhead and spring Chinook salmon migrating out of the WWRB.

- Operate fish counting facility at Nursery Bridge ladder to document run size and migration timing of adult steelhead, bull trout, and spring Chinook.

- Monitor stream temperatures at various locations through the WWRB.

- Examine movements of adult steelhead and bull trout through the WWRB using radio-tag technology.

- Examine movements of juvenile steelhead and bull trout through the WWRB with radio- and PIT-tag technology.

4.05 WATER QUALITY BASELINE INFORMATION

The Walla Walla River and some of its tributaries are currently listed on both Oregon and Washington's 303(d) list for water quality limited streams, as per the Clean Water Act. Although flow is not a specific component of water quality standards under the Clean Water Act, it is recognized that flow impacts water quality through temperature, sediment, habitat, and other factors.

The ODEQ and the Washington Department of Ecology (WDOE) are both currently developing, under different schedules, TMDLs on the main stem Walla Walla River for specific water quality parameters.

The U.S. Environmental Protection Agency (EPA), in cooperation with other state and Federal agencies, has developed draft guidance on temperature standards for the region. This guidance relies on establishing the river system's natural gradient of temperature for support of beneficial uses. The ODEQ is using flow as one indicator in modeling the system potential for temperature in the main stem Walla Walla River. Early modeling results show that the target flows indicated in section 2.01 of this study are consistent with efforts to meet temperature criteria under Oregon's water quality standards.

The general scope of this activity includes compilation from existing sources of water quality data that may be related to the flow concerns and limiting factors for fish habitat quality being addressed in this study.

4.06 APPLIED TECHNOLOGIES/DFATA MANAGEMENT

Corps Geographical Information System (GIS) technologies will be integrated into the various environmental compliance activities. GIS will assist the interdisciplinary team in their analysis and modeling of complex resource issues related to alternatives development, baseline inventories, and assessment of "with" and "without" project conditions. The GIS will produce plates needed for the FR/EIS, and allow data to be available on the District’s web site. The plates will also be used for public meetings and other FR/EIS coordination activities. Numerical and other statistical reports will be generated, and include such information as acreage, land ownership, percentage of slope, and vegetation types. Graphs (pie charts, lineal progression, predications) and other visual aids will be used to facilitate information interpretation. Coordination will be conducted with the local Sponsor on sharing and integration of respective GIS data.

New data generated for this study will be condensed and made to conform to GIS standards. New data will be organized to the Tri-Service Spatial Data Standard, as required by Engineer Regulation (ER)1110-1-8156*, Policies, Guidance, and Requirements for Geospatial Data and Systems*. Metadata (descriptive information on the content of new GIS data files) will be created and sent to the Corps' national metadata server.

SECTION 5.0 - ENVIRONMENTAL COMPLIANCE

5.01 GENERAL

Construction, placement, and implementation of structural and operational components associated with the recommended plan for instream flow measures in the WWRB will require coordination with appropriate agencies, special interests, and the general public, as well as compliance with applicable environmental laws and regulations. These requirements include, as a minimum, compliance with the NEPA, ESA, Fish and Wildlife Coordination Act (FWCA), Clean Water Act (CWA), National Historic Preservation Act (NHPA), and various other related laws, regulations, and Executive Orders. Environmental compliance will include development of an EIS. The EIS will be integrated within the feasibility study and FR/EIS and will not be a separate stand-alone document.

5.02 CORPS PUBLIC OUTREACH

a. Notice of Intent

As soon as practicable after a decision is made to prepare an EIS, a Notice of Intent will be published in the Federal Register to announce the scoping process.

b. Scoping Meeting

A public scoping meeting will be conducted to provide the public opportunity to voice their concerns, opinions, and recommendations on the proposed action and potential alternatives for accomplishing the goal of the feasibility study. The scoping meeting will be conducted in accordance with the procedures outlined in section 8.0, Public Outreach.

c. Public Review and Public Meetings

Two public reviews of the feasibility study and FR/EIS will be conducted. The public reviews will be conducted in accordance with the procedures outlined in section 8.0, Public Outreach. The first review will provide the public a 45-day opportunity to comment on the draft FR/EIS. A public meeting will be held midway through the review period to describe the project and provide the public opportunity to comment. Written and electronic comments will be accepted throughout the comment period.

The second public review will provide the public a 30-day opportunity to comment on the final draft of the FR/EIS.

5.03 SPONSOR PUBLIC OUTREACH

The Sponsor will conduct a multi-faceted public outreach program designed to bring maximum community support to this project for the purposes of furthering public input and understanding of project goals. The Sponsor's public outreach program is detailed in section 8.02.

5.04 FEASIBILITY REPORT/ENVIRONMENTAL IMPACT STATEMENT

As indicated above, the FR/EIS will be a single combined document. The FR/EIS will address all aspects necessary to satisfy requirements for a Corps GI Study; the NEPA; and other appropriate laws, regulations, and guidance.

A multi-disciplinary team from the Corps and Sponsor will be assigned to develop the FR/EIS. This core team will be led by an individual assigned to coordinate plan formulation. The lead for Plan Formulation will assure compatibility of baseline studies and proposed actions and will coordinate overall development of the combined FR/EIS document. A separate lead will also be assigned to coordinate execution of the procedural provisions of NEPA.

Relevant issues addressed in the FR/EIS are expected to include physical, biological, social, and economic resources. Initially, these resources are expected to involve geology and soils, air quality, water resources, aquatic resources, terrestrial resources, threatened and endangered species, cultural resources, Native Americans, agriculture and irrigation, land ownership and use, recreation and tourism, social resources, and aesthetics. However, the scoping process will principally define the relevant resource issues.

Procedures of and evaluations for the FR/EIS will include, but not be limited to the following:

a. Ecological Analyses

Terrestrial and aquatic investigations will be conducted to establish the necessary baseline knowledge or to refine the current knowledge of the ecology of the specific project area not addressed in the baseline studies identified in section 4.0. The information will be used to define "future without project conditions" and "future with project conditions," assess the impact and benefits associated with the various options, and facilitate identification of appropriate mitigation measures.

b. Regional Restoration Efforts

The CTUIR will prepare an appendix describing known public and private aquatic restoration activities being conducted in the Walla Walla River subbasin. This information will demonstrate the link between the proposed project and other regional

efforts and will highlight potential opportunities for additional restoration measures. It will also be used to help prepare the "without project condition" description.

c. Endangered Species Act

It is anticipated that formal consultation, with both NMFS and USFWS, which includes Biological Opinions, will be required to address the concerns of the ESA.

1. Site Evaluation

All proposed project areas will be examined for potential sensitive flora and fauna. This will be accomplished in part through the surveys previously identified and through FWCA investigations.

2. Species List

A list will be requested from the USFWS of endangered, threatened, proposed, and candidate species under the ESA. This list is not required by NMFS for consultation.

3. Biological Assessment for Terrestrial Flora and Fauna and Resident Fish (USFWS)

Based on those species identified by the USFWS, a Biological Assessment will be prepared and coordinated. A determination will be made of the effect and a concurrence or biological opinion will be requested from the USFWS.

4. Biological Assessment for Anadromous Fish (NMFS)

The work proposed to improve instream flows in the proposed project area will be coordinated with the NMFS. A Biological Assessment will be prepared and a concurrence or a biological opinion will be requested from NMFS.

d. Fish and Wildlife Coordination Act

The USFWS will review the alternatives as they develop and provide some preliminary insights on the effects of the alternatives. As the final alternative is developed, the USFWS will provide a detailed analysis of the effects to the fish and wildlife resources associated with the proposed project. The Coordination Act Report will address avoidance and mitigative measures as appropriate. Monitoring requirements will also be suggested.

e. Mitigation Plan

The construction of an ecosystem restoration project should be designed to avoid the need for fish and wildlife mitigation. However, mitigation may be required for

terrestrial and aquatic resource impacts resulting from the construction of a project. Analysis will be needed to assess specific impacts; the habitat lost; and the proposed quantity, area, and method of compensation if determined appropriate. Monitoring of mitigation actions may also be appropriate to ensure the mitigation actions have achieved the study objective. The level of monitoring will be developed to be consistent with the magnitude of the project and probability of success of the mitigation. Measures for monitoring mitigation will be included in a monitoring plan as discussed in section 5.12.

f. Clean Water Act

The project will be evaluated for compliance with Sections 401, 402, and 404 of the Clean Water Act. This includes development of the Section 404(b)(1) Evaluation and coordination with the state(s) for Section 401 Certification.

g. National Historic Preservation Act

1. Cultural Resource Identification

All proposed project areas will be examined to identify cultural resources. This will include searches of both file and existing site information. Intensive field surveys and archeological testing will be completed as needed. A report will be prepared of the findings and recommendations.

2. Cultural Resource Report

If required, site testing may be needed to determine cultural resource significance and eligibility for listing under the National Register of Historic Places. Cultural resources identified under section 5.04 g.1 above will be evaluated as appropriate. Because the need for conducting site tests is unknown at this time, costs associated with this effort are not reflected in this PMP. Subsequent determination of the need to conduct site testing will require revision of the cost estimate.

3. Mitigation Plan

Cultural resource mitigation work may be needed if identified cultural resources are determined to be listed or eligible for listing in the National Register of Historic Places and the eligible or listed properties cannot be avoided by project activities. Mitigation measures will be based on the type of cultural resources affected and the nature of anticipated project impacts. The mitigation measures could range from site protection to data recovery. If a mitigation plan is required based on the alternative selected, additional costs will be incurred that are not reflected in this PMP.

4. Coordination with State Historic Preservation Offices

Coordination will be conducted with appropriate state Historic Preservation Offices, the Advisory Council on Historic Preservation, and all other interested parties as required by applicable laws and regulations.

h. Government-to-Government Consultation/Coordination

Consultation/coordination will be done on a Government-to-Government basis with all affected Native American Tribes. It is expected that coordination will be primarily with the CTUIR. Since CTUIR is the study Sponsor, consultation will be an integral and built-in feature of the study. Based on this, no separate costs for Government-to-Government consultation have been developed.

i. Hazardous, Toxic, and Radioactive Waste (HTRW)

The HTRW evaluations will be conducted, including a preliminary assessment and a detailed site inspection report. The preliminary assessment will outline a proposed sample and analysis design. The site inspection report will include historic information about the land use in the project area and data from any testing at the project site.

j. Environmental Monitoring

Monitoring may be necessary to determine if the predicted outputs are being achieved and to provide feedback for future projects. Monitoring of mitigation actions may also be appropriate to ensure the mitigation actions have achieved the study objective. The need for monitoring, extent of monitoring efforts, and type of monitoring will be determined during the development of the feasibility study.

If determined necessary, a monitoring plan will be developed with the assistance of the Sponsor, which will later be implemented by the Sponsor. Such plan will address types, frequency, and duration of surveys as well as utilization of results.

k. Coordination With Other Agencies

The feasibility study and FR/EIS will be coordinated with other agencies including USFWS, NMFS, and state Departments of Environmental Quality.

l. Appendices

Appropriate appendices to the feasibility study and FR/EIS will be determined during the feasibility study. The following appendices have been preliminarily identified in conjunction with environmental compliance activities: Coordination Act Report, Endangered Species Act Consultation, Clean Water Act Section 404(b)(1) Evaluation,

Cultural Resources, Natural Production and Monitoring, Aquatic Restoration Activities in the Walla Walla River Subbasin, Mitigation Plan and Monitoring Plan.

5.15 RECORD OF DECISION

Upon completion of the final FR/EIS, a Record of Decision will be prepared to document the decision.

SECTION 6.0 - ECONOMIC, SOCIAL, AND REGIONAL ANALYSIS

6.01 GENERAL

This task will be performed by the Corps. It will include an environmental restoration incremental analysis along with a sensitivity analysis and an analysis of the Sponsor's Financial Plan and ability to pay. The socioeconomic effects of the preferred alternative will be prepared for the EIS. A regional analysis will be performed to determine the effects of the preferred alternative on local jobs and income.

The incremental analysis will determine the most cost effective measures to implement environmental improvement in the study area.

A sensitivity analysis will quantify uncertainties in key variables that affect the cost and benefits of each measure.

An economic appendix will be provided for inclusion in the technical documentation for the feasibility study that will include the development of incremental costs and benefits for each alternative, the socioeconomic effects, and effects on local jobs and income.

The financial capability analysis will examine the non-Federal Sponsor's organizational, legal, and financial capability to undertake the required financial obligations for implementation of the project after it is authorized for construction by Congress.

The non-Federal Sponsor will prepare a financing plan showing cash flows over the entire project period with an accompanying statement of financial capacity (including a Statement of Revenues and a Statement of Funds for the last 3 years).

6.02 TASKS

a. Review Existing Data

Review all existing relevant background information that will affect the economic analysis.

b. Attend Team Meetings

Attend all team meetings in order to distinguish critical factors affecting the economic analysis.

c. Prepare Project Cost Summary, Including Interest During Construction

The economist will calculate total investment costs of all alternatives. Cost engineering will furnish total project costs and determine length of construction period for all alternatives.

d. Determine Benefits and Unit of Measuring Benefits for All Alternatives

Corps biologists will furnish method of determining all environmental benefits units and furnish the unit numbers to the economist for input into the incremental cost analysis model.

e. Complete an Incremental Cost Analysis Comparing Base Case with All Selected Alternatives

The economist will, with the help of the biologist and cost engineer, determine appropriate combinations of alternatives to run in the model. The economist will, with advisement from the biologist and cost engineer, complete a sensitivity analysis of benefits/costs for the preferred plan. The expected range of benefits and costs will be expressed along with the best and worst case given a range of conditions surrounding input variables such as environmental benefit units and dollar cost units surrounding the preferred plan.

f. Financial Capability Documentation

The economist will summarize the financial capability of the Sponsor. The Sponsor shall furnish a statement of financial capability presenting statements of earnings and balance sheets for the past 3 years along with cash flow expectations over the financial life of the project which includes amortization of Sponsor's share of total investment costs, Sponsor's share of yearly operations and maintenance costs, adaptive management costs, and monitoring plan costs.

g. Socioeconomic and Demographic Issues for EIS

The economist will present a full socioeconomic demographic analysis relating to the project geographic area with an analysis of effects resulting from the preferred alternative.

h. Regional Analysis Relating to Alternatives

The economist will perform a regional analysis relating to the effects of the preferred plan on local income and jobs in the project geographic area.

i. Project Report

The economist will prepare an economic summary report for the feasibility study and FR/EIS.

6.03 CALCULATION OF ENVIRONMENTAL BENEFITS

Benefits derived from the ecosystem restoration work coming out of this feasibility study will be derived from improvements to Walla Walla River subbasin aquatic and riparian habitat. The unit of measure for quantifying biological benefits anticipated from these improvements will be the HU that is the unit of measure to be used in the incremental cost/benefit analysis. Calculation of HUs will be based on the relative biological value of a particular habitat attribute according to the best judgment exercised by Corps, tribal, and agency fisheries professionals.

Benefits will initially be expressed in conventional units such as rate of flow in cfs or area in square meters and then converted to HUs, which takes into account limiting factors and is based on best professional judgment.

SECTION 7.0 - REAL ESTATE

7.01 GENERAL

The Corps, Real Estate Division, study input will include preparation of preliminary real estate cost estimates for project requirements, participation in pre-project cooperation agreement activities, preparation of a gross appraisal report, preparation of the Real Estate appendix for inclusion in the feasibility study, and preparation of a baseline cost estimate for real estate in the microcomputer-aided cost estimating system (MCACES). It is assumed that the local irrigation ditch/canal district(s) will provide access to the Sponsor for construction and operation and maintenance for the irrigation efficiency measures. Any private property involved will be secured by the Sponsor via perpetual easements or purchase. The number of affected owners is not presently known at this time.

7.02 COORDINATION

This activity includes, but is not limited to, the Corps, Real Estate Division, participation in team meetings; negotiation of work agreements; securing required rights-of-entry for testing/investigative purposes; Real Estate Attorney preparation of Attorney's Opinion of Compensability, non-standard language for land acquisitions, and evaluation of lands, easements, rights-of-way, relocations, and disposal areas (LERRD) for crediting; coordination with other offices on project data needed for Real Estate Division's major study products; and monitoring of progress and findings associated with real estate study products. This project will require additional coordination with the Sponsor, attendance at public meetings, etc.

7.03 PREPARATION OF PRELIMINARY REAL ESTATE COST ESTIMATES

This activity includes the development of preliminary (reconnaissance level of detail) estimates of total real estate costs associated with proposed project scenarios. The real estate cost estimates include a value estimate of the project's real property requirement; an estimate of any Public Law 91-646 relocation payments resulting from the project's real property acquisitions; an estimate of the Sponsor's administrative cost to accomplish the project's real property requirements; and an estimate of the administrative costs for the Corps, Real Estate Division, to monitor the Sponsor's acquisition program.

7.04 PREPARATION OF GROSS APPRAISAL

This activity includes preparation of a gross appraisal report, which provides a detailed estimate of all real estate costs associated with acquisition of the project's real property requirements. (See ER 405-1-12, *Real Estate Handbook,* Chapters 4 and 12.)

7.05 PREPARATION OF REAL ESTATE APPENDIX

This activity includes preparation of the Real Estate appendix, which is the overall plan describing the minimum real estate requirements for the project. (See ER 405-1-12, Chapter 12.)

7.06 REVIEW AND REVISION OF REPORT DOCUMENTS

This activity includes all Corps, Real Estate Division, actions involved in reviewing the feasibility study documents and responding to comments.

7.07 PREPARATION OF BASELINE COST ESTIMATE FOR REAL ESTATE

This activity includes accounting for the project's total estimated real estate cost in Code of Accounts as required by EC 1110-2-538 under feature 01, Lands and Damages, and 02, Relocations, as necessary. This estimate of total real estate cost should include costs for all Federal and Sponsor actions necessary for completion of the project.

7.08 TOTAL REAL ESTATE COSTS

The estimated cost for the real estate listed generally by restoration objective:

Irrigation efficiency	$12,600 per ownership	$50,749
Off-channel storage	$11,500 per ownership	$53,526
Water exchange		$84,400
Water rights acquisition	$2,000 per water right	$
		COE
		$38,806
		CTUIR
		$86,450

SECTION 8.0 - PUBLIC OUTREACH

8.01 PUBLIC OUTREACH

a. Outreach Goals

A goal of public outreach is to convey to people of the region that the feasibility study and FR/EIS is important to the future of the region so that individuals will want to become informed and involved in the planning process. Public outreach efforts allow individuals and groups to ensure that their perspectives are heard and factored into the planning process. Conversely, the Corps ensures that it has considered all of the significant issues and developed a plan for public disclosure of the proposed project.

Another goal of public outreach is to support the development of the project in a manner that allows for input from all communities impacted by water in the WWRB. To do this a comprehensive vision of ecosystem restoration to a level in harmony with social values (tribal and non-tribal) and optimized basin economics is necessary.

As such, the Sponsor's and Corps' public outreach efforts will include a broad-based approach to community. Community is defined as residents and citizens of the WWRB and all CTUIR tribal members, who hold treaty rights to their ceded territories, which includes the WWRB, regardless of their current residence.

The Sponsor recognizes that CTUIR tribal members have not had a very visible presence in the WWRB during the past few generations due in part to the fact that their primary treaty and cultural resource, salmon, has not been available in the WWRB for many years. A vision of sustainability has not evolved to the extent that it has so far in the adjacent Umatilla Basin. In order for tribal resources to formally Sponsor this project, new generations of tribal members must develop a realization of a sustainable vision that re-establishes the environmental values necessary for the community's future investment decisions.

b. Outreach Objectives

The physical groundwork for aquatic ecosystem restoration and salmon reintroduction is assuring adequate instream flow restoration through this project, along with other components as necessary. The cultural groundwork for aquatic ecosystem restoration and salmon reintroduction is through public outreach efforts that will be designed to:

- Raise awareness and understanding by informing people about the FR/EIS purpose and process.

- Create opportunities for people to be involved in the planning process.

- Motivate agencies, stakeholders, tribes, and the public to become partners in developing a project that will be mutually acceptable.

- Re-establish a living vision of all people's relationship (environmentally, economically, and socially) to each other.

- Introduce the residents and citizens of the WWRB community to the Tribes, including tribal culture, treaty rights, and tribal connections to water and salmon; in order for all to understand a different perspective of seeing things as a whole, in one piece (less departmentalization)

- Create a citizenry base that is more aware of the natural environment, how the economics of the basin function, and aware of other cultures in the basin. From this determine how these different constituencies can contribute to this project.

From these create community values and underpinning for investments and contributions to the project.

c. Corps Outreach Activities

(1) Internet Website

A web page, accessible through the Walla Walla District's Internet Website, will be established for the restoration project. The Reconnaissance Report, meeting announcements, and other pertinent information will be posted on the site. The site will be capable of receiving e-mail and will be a designated mechanism for public submittal of comments during public review periods.

(2) Newsletters

An estimated four newsletters will be produced and distributed during the feasibility study. The first newsletter will describe the restoration project and study process, summarize the issues and concerns raised during the scoping meeting, and invite recipients to visit the restoration project's website.

A second newsletter will be prepared and distributed approximately 1 month prior to release of the draft FR/EIS for the first public review. It will generally describe the current status of the project and announce the impending public review of the draft FR/EIS.

The third newsletter will be released approximately 1 month prior to release of the draft final FR/EIS for the second and final public review period. This newsletter will describe the current status of the project and announce the impending public review of the preliminary final FR/EIS.

The fourth newsletter will be distributed announcing the signing of the Record of Decision, availability of the document, and potential actions that may follow.

(3) Media

Television, radio, and print media services will be solicited to provide public service announcements. News releases will be developed and distributed by the Walla Walla District Public Affairs Office at times deemed appropriate by the Project Manager. Paid advertisements will be utilized in conjunction with scoping and public meetings.

(4) Mailing Lists

The Walla Walla District prepared a mailing list during preparation of the Reconnaissance Report. The District will update the list periodically as individuals and parties become interested in the project. The list will service public outreach efforts related to newsletters, scoping meetings, and public meetings.

(5) Public Meetings and Review Periods

As discussed in section 4, a scoping meeting will be conducted early in the feasibility study to identify issues, concerns, and significant resources and a public meeting will be conducted in conjunction with public review of the draft FR/EIS.

(a) Scoping Meeting

A press release announcing the scoping meeting will be prepared and distributed to local television, radio, and print media. Scoping letters will be sent to those individuals on the existing Reconnaissance Report mailing list. Paid advertisements will be published in selected print media 2 weeks, 1 week, and 1 day prior to the public scoping meeting. The paid ads will be published, at a minimum, in the Walla Walla Union-Bulletin, the Valley Herald, the Waitsburg Times, La Voz (Hispanic newspaper), and the Dayton Chronicle. Meeting date, time, location, format, facilitator, and presenters will be established in advance. Agendas will be distributed to meeting attendees. Comment cards will be provided to attendees wishing to submit written comments within a to-be-designated time period. A newsletter documenting issues, concerns, and recommendations raised during the scoping meeting will be produced and distributed to the mailing list following the scoping meeting.

(b) Public Meeting and Review Periods

The draft FR/EIS will be distributed for a 45-day public review. Mid-way through the review, a public meeting will be held to answer questions and receive comments about the draft. A press release announcing the public review period and public meeting will be prepared and distributed to local television, radio, and print media. Paid advertisements will be published in selected print media 2 weeks, 1 week,

and 1 day prior to the public meeting. The paid ads will be published, at a minimum, in the Walla Walla Union-Bulletin, the Valley Herald, the Waitsburg Times, and the Dayton Chronicle.

Comments received will be evaluated and incorporated into a final version of the FR/EIS. The proposed final will then be redistributed for a 30-day public review. Responses to the final comments will then be prepared and incorporated into the document.

Meeting dates, times, locations, format, facilitator, and presenters will be established in advance. Agendas will be distributed to meeting attendees. Comment cards will be provided to attendees wishing to submit written comments within the public review period. If there are no significant issues raised during the 30-day review, the draft will be considered final and a Record of Decision will be prepared. The fourth newsletter will then be distributed to the mailing list. A press release will be prepared and distributed by the Walla Walla District Public Affairs Office.

d. Sponsor's Outreach Activities

(1) Community Forums

The Sponsor will participate in forums developed by the WWRB community in an effort to promote understanding about the Tribes' Sponsorship of the project, project goals, and developing the groundwork for support of the project (e.g., events, open space, meetings, and forums Sponsored by the Walla Walla River Basin Watershed Council events, Walla Walla Watershed Alliance, Whitman College, etc.)

(2) The CTUIR-Sponsored Events

The Sponsor will present information at host events to increase the awareness, knowledge, and understanding of the Walla Walla Watershed ecosystem restoration activities. Events will include:

- Established watershed education projects such as the Salmon Walk (an annual event that included WWRB watershed activities for the first time in 2001).
- Salmon Expedition (school programs focused on watershed health and salmon will expand to include educating and informing teachers and youth in the WWRB starting in 2002).
- New events to be held in the WWRB.

(3) Environmental Awareness Activities

Consistent with the above goals and objectives, the Sponsor will:

Work with schools and young adults in the WWRB to teach students bout the history and culture of the Cayuse, Walla Walla, and Umatilla Tribes(Teaching environmental sustainability requires involvement of youth of the community; especially given the long-term nature of the project execution and future outputs. These people are the ones in the future who will be responsible for and benefit from the outputs of this project)

- Travel with tribal elders to the WWRB to teach tribal children about their history and future in the Walla Walla area.

- Educate the community regarding tribal fishing activities in the Walla Walla Basin.

- Promote opportunities for an exchange of environmental and cultural values between tribal members and community members to generate a shared understanding of the project's goals and benefits to both communities.

- Develop and/or participate in festivals and feasts for celebration and an academic/environmental cultural exchange that focuses on the benefits of the watershed and the land to all the affected communities.

(4) Community Dialogue

- The Sponsor will participate in/host meetings with civic groups, interest groups, churches, and other community-based organizations to promote project goals and benefits.

- Sponsor leadership, tribal members, and staff will participate in EIS public meetings and forums.

- Sponsor will submit guest editorials and information items to local newspapers, radio, and television and encourage media coverage of the project as it progresses.

- The Sponsor will interact with regional and community leaders to develop long-term understanding and education about the project goals.

- The Sponsor will conduct outreach with Tribal leaders and Tribal General Council members regarding the technical and policy aspects of the project as it progress, provisions for project review, and input into the project.

SECTION 9.0 - PRODUCTS, SCHEDULE, AND MILESTONES

The study duration is approximately 6 to 8 years. The duration depends upon the adequacy and timeliness of funding and the results of the various reviews. Final approval of the feasibility study and supporting documents will be contingent upon public and agency review and the review and approval of higher-level Corps offices.

For further information on schedule, see the attached appendix that has milestones of the project (using Microsoft Project). A detailed schedule, using computer software that shows a Gantt chart, duration, dependencies, predecessors, etcetera will be developed early in the feasibility phase and thereupon will be updated in the COE P2 system.

Independent Technical Review (ITR)

ITR will take place for this project after a Preferred Alternative has been chosen. The purpose of the ITR is to provide a "fresh look" at the project from a set of peer experts who can examine the project without any bias.

The ITR will be conducted by members who are employees of the Northwestern Division (located in Portland, Oregon) and/or the Planning Center of Expertise (located in Mississippi Valley Division office, located in Vicksburg, MS).

Disciplines that will be needed to review this project will be the same as those who worked on the project within the Walla Walla District. They are as follows:

Project Manager

Fisheries Biologist
Wildlife Biologist
Archeologist
NEPA Specialist
Environmental Resources Specialist
Economist
Landscape Architect

Mechanical Engineer
Civil/Soils Engineer
Structural Engineer
Hydraulic Engineer
Hydrology Engineer
Cost Estimate Engineer

Real Estate Appraiser

After a review by this team, the comments generated will be forwarded to the NWW PDT, who will be given a chance to review them. Then the IDT and PDT will meet to discuss the comments generated and come to a resolution upon them. It is anticipated that the sponsor will want to participate throughout the IDT process as well. There are

20 business days presently allocated for the completion of the ITR in the project schedule.

After the ITR, the document will modified for release to the public, and then and Alternative Formulation Briefing (AFB) will take place as well.

SECTION 10.0 - FEASIBILITY STUDY COST ESTIMATE

Estimated feasibility study costs are based on an analysis of the tasks and work elements to be accomplished by the Corps' Walla Walla District and the Sponsor. Baseline cost estimates are included in this PMP and contain consideration of in-house labor (Corps and Sponsor), estimated travel, production of reports, supervision and administration, indirect and overhead charges, and an overall study contingency.

The feasibility study cost estimate presented herein is preliminary and is based on an estimate of the number of sites that will be evaluated in this study. Input will be solicited from interested parties including the public and other agencies to identify specific sites that will be included in the study. Table 10-1 shows the numbers assumptions upon which the preliminary cost estimate is based.

Table 10-1. Assumptions for Preliminary Cost Estimate.

Purpose of Evaluation	Preliminary Evaluation	Detailed Evaluation/Planning
Storage Reservoir	7 sites	2 sites, covering 15 acres (6 hectares) (each) with appurtenant disturbance
Exchange	2 conveyance options	2 conveyance methods
Irrigation Efficiency	All diversions > 5 cfs (0.1 cms)	All diversions > 5 cfs (0.1 cms)
a. Lining ditches	a. 10 miles (16 km)	a. 6 miles (10 km) (6 std details). A total of 30 acres (12 hectares) of wetland would be impacted.
b. Consolidation of ditches	b. 5 miles (8 km)	b. 5 miles (8 km). A total of 15 acres (6 hectares) of wetland would be impacted.
c. Application efficiency	c. 1,000 acres (405 hectares)	c. 500 acres (202 hectares) [cost/acre (hectare)]
Water Right Acquisition	25 water rights	15 water rights. A total of 30 acres (12 hectares) of wetland would be impacted.

The feasibility study is estimated to cost $6,820,000 of which $3,410,000 is Federal cash contribution, $0 (zero) is the CTUIR cash contribution, and $3,410,000 is the CTUIR in-kind services contribution.

SECTION 11.0 - CERTIFICATION

This is to certify that the undersigned have supervised staff preparation of this PMP; reviewed the document; and concur with the scope, structure, and estimated cost of $6,354,070 for the WWRB Feasibility Study.

_____/s/_____ _____
Paul Wemhoener DATE
Deputy District Engineer,
Planning, Programs, and Project
Management Division

_____/s/_____ _____
Antone C. Minthorn DATE

Chairman, Confederated Tribes of
the Umatilla Indian Reservation

If further changes in this scope of work, cost, and schedule are necessary throughout the life of the feasibility study, approval to make those changes has been delegated to the Project Manager for both the Corps and the Sponsor; except in the case where those changes would add significant increase to the duration of the study or if there was a net cost increase. If either of those conditions exist, then approval by the DDE and the Chairman of the CTUIR would be required.

SECTION 12.0 - DOCUMENTS GOVERNING CONTENT OF FEASIBILITY STUDY

The following documents define the required scope of the feasibility study in terms of content and level of detail.

The following documents define the required scope of the Feasibility Study in terms of content and level of detail.

a. Engineer Circular (EC) 1105-2-208, December 23, 1994, *Preparation and Use of Project Study Plans*, Department of the Army guidance for project study plans which guide the feasibility process.

b. EC 1105-2-210, June 1, 1995, *Ecosystem Restoration in the Civil Works Program*, Department of the Army guidance for ecosystem restoration activities.

c. Engineer Regulation (ER) 5-7-1, March 1, 1991, *Project Management*, Department of the Army regulation for the overall management of civil works projects.

d. ER 200-2-2, March 4, 1988 [33 Code of Federal Regulation (CFR) 230], *Procedures for Implementing NEPA*, Department of the Army regulation on Environmental Quality.

e. ER 1105-2-100, April 2000, *Planning Guidance*, Department of the Army Regulation on Policy and Guidance for the conduct of civil works planning studies.

f. U.S. Water Resources Council Publication, March 10, 1983, *Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies.*

g. ER 5-7-1 Federal Register (FR), March 1, 1991, *Project Management*, Department of the Army regulation for the overall management of civil works projects.

h. ER 1110-2-1150, March 31, 1994, *Engineering and Design for Civil Works Projects*, Department of the Army regulation for engineering level of detail in feasibility studies.

SECTION 13.0 - LITERATURE CITED

Buchanan, D. V., M. L. Hanson, and R. M. Hooton. 1997. *Status of Oregon's Bull Trout: Distribution, Life History, Limiting Factors, Management Considerations, and Status*. Portland: Oregon Department of Fish and Wildlife.

Leopold, L.B., M.G. Wolman, and J.P. Miller. 1964. *Fluvial processes in geomorphology.* Freeman, San Francisco, CA: 522 pp.

Mendel, G., V. Naef, D. Karl 1999. *Assessment of Salmonid Fishes and their Habitat Conditions in the Walla Walla River Basin – 1998 Annual Report*. Washington Department of Fish and Wildlife Report # FPA99-01, for U.S. Department of Energy, Bonneville Power Administration Fish and Wildlife Project # 98-20.

Nielson, R. S. (1950). *Survey of the Columbia River and its Tributaries, Part V*. Washington, DC: U. S. Fish and Wildlife Service.

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Van Cleve, R. and Ting, R. (1960). The Condition of Salmon Stocks in the John Day, Umatilla, Walla Walla, Grand Ronde, and Imnaha Rivers as Reported by Various Fisheries Agencies.